MARKET ANALYSIS OF ELECTRONIC MAILBOX SERVICES

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MARKET ANALYSIS OF ELECTRONIC MAILBOX SERVICES

Prepared For:

RESEARCH INSTITUTE OF TELECOMMUNICATIONS
AND ECONOMICS (RITE)

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NOVEMBER 1980

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ABSTRACT

This report surveys the use of electronic mailbox services in the U.S., featuring the COMET electronic mailbox service offered by Computer Corporation of America. An outline of this service as well as responses by users is included. The report addresses such issues as why users chose this system, what type of users they are, what they would like to see improved, and what future plans they have for electronic mailbox services. Users of General Electric Information Services Company's MARK III computer service were surveyed to measure their interest in using an electronic mailbox service from GEISCO if it were made available. A description of the GEISCO internal electronic mailbox service is included. The report also provides a summary of the U.S. regulatory climate limiting the offering of electronic mailbox services, together with a history of U.S. regulations and their impact on communications carriers. Conclusions and recommendations from the research are included.

Y-RIT
November 1980

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1 INTRODUCTION

I INTRODUCTION

- This report contains the results of research INPUT performed on the subject of electronic mailbox services for the Research Institute of Telecommunications and Economics (RITE).

- The scope of the study was finalized on October 15, 1980, to include the following research:

  - Interviews with five users of the Computer Corporation of America (CCA) COMET system.

  - Five interviews with users of the General Electric Information Services Company (GEISCO) Mark III timesharing services for opinions on a potential GE mailbox service.

  - Brief status reviews of both CCA and its COMET system, and General Electric Information Services and its CROSSFILE products.

- The information in this report is based primarily upon INPUT's interviews with users of mailbox and timesharing services.

  - Additional data were obtained from interviews with CCA and GEISCO.

  - Secondary data were obtained from INPUT research reports and literature from electronic mailbox library files.

- The objectives of the study were:

  - To determine the responses to questions by COMET and GEISCO users about electronic mailbox systems.

  - To review the current status of COMET and CROSSFILE products.

  - To prepare oral and written reports to RITE that document the results of this research.

- The analyses contained herein represent INPUT's best judgement based upon the data and time available for conducting this study.

- At the time this research was initiated, it was illegal for computer services companies to offer electronic mailbox services (EMS) without an FCC tariff. During the course of this research, the FCC has changed its regulations and EMS may be offered by computer services firms without an FCC tariff. Further discussion of this subject is included in Appendix D.

II EXECUTIVE SUMMARY

II EXECUTIVE SUMMARY

A. ELECTRONIC MAILBOX DEFINITION

- Electronic mailbox service (EMS) focuses on the handling of messages before and after transmission. Handling includes:

  - Creating messages.
  - Editing messages.
  - Addressing messages.
  - Reading messages.
  - Filing messages.
  - Forwarding messages.

- EMS is oriented towards person-to-person information exchange using terminals and a computer-based electronic transmission network.

- EMS is offered by computer services firms on their centralized computers. Terminals are connected to these via leased lines, normal telephone lines and specialized common carriers. Exhibit II-1 shows a typical computer service configuration.

B. COMET USER ANALYSIS

- User respondents have limited experience with COMET. Exhibit II-2 shows that users have had COMET installed an average of 1.4 years. COMET was not introduced until March of 1978.

- Messages are short and usually transmitted between middle-management levels.

- Communicating word processing terminals are considered ideal by COMET users.

  - Commands are easier to learn.

  - EMS is considered a first step towards office automation.

  - However, the edit feature is considered very weak.

- Initial user assessment is positive.

  - Expansion of the number of users and geographic coverage is planned.

  - Use of COMET promotes other network services.

  - Users reported the most satisfaction with transmission speed and message documentation features.

EXHIBIT II-1

TYPICAL COMPUTER SERVICE EMS OFFERING

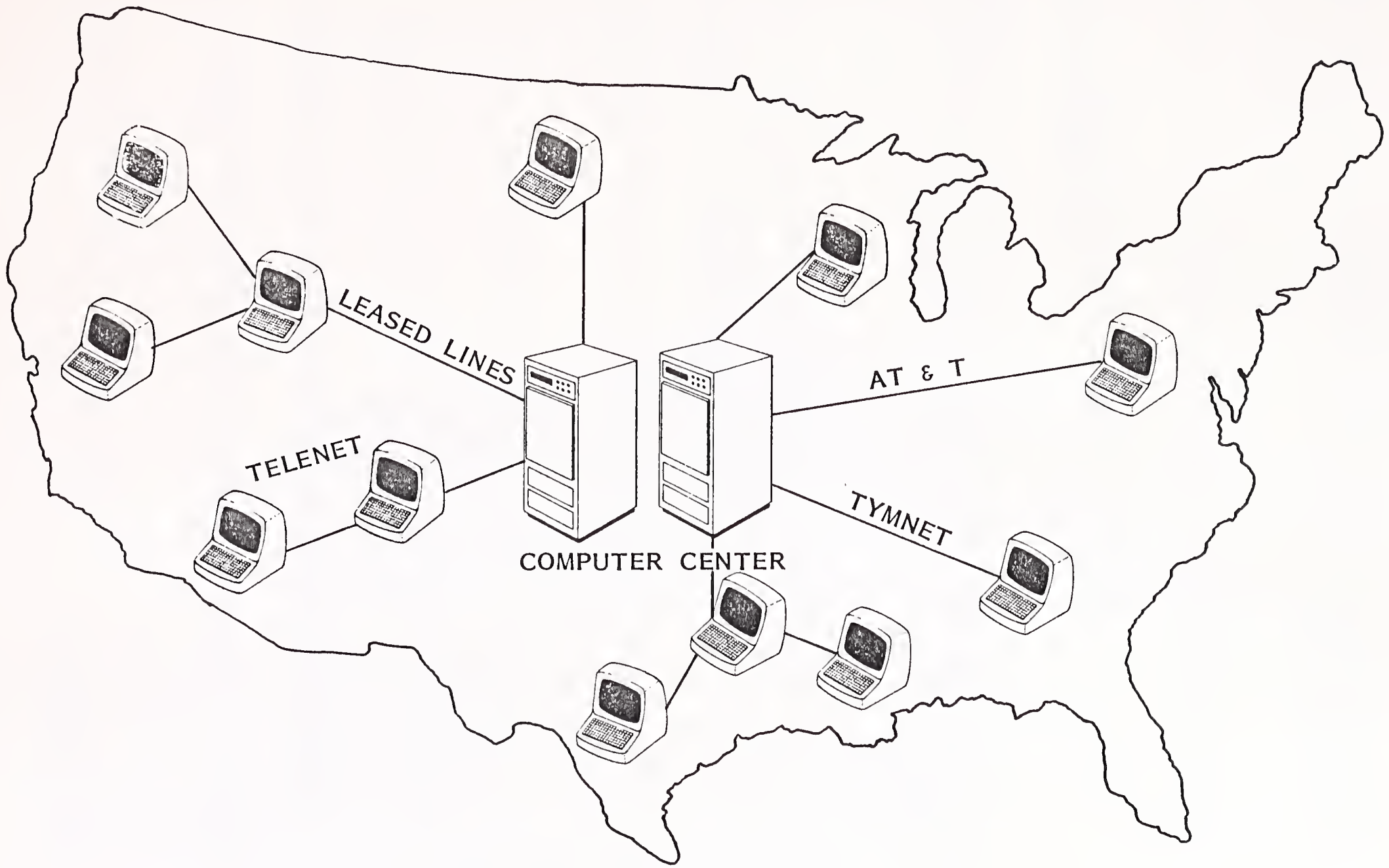
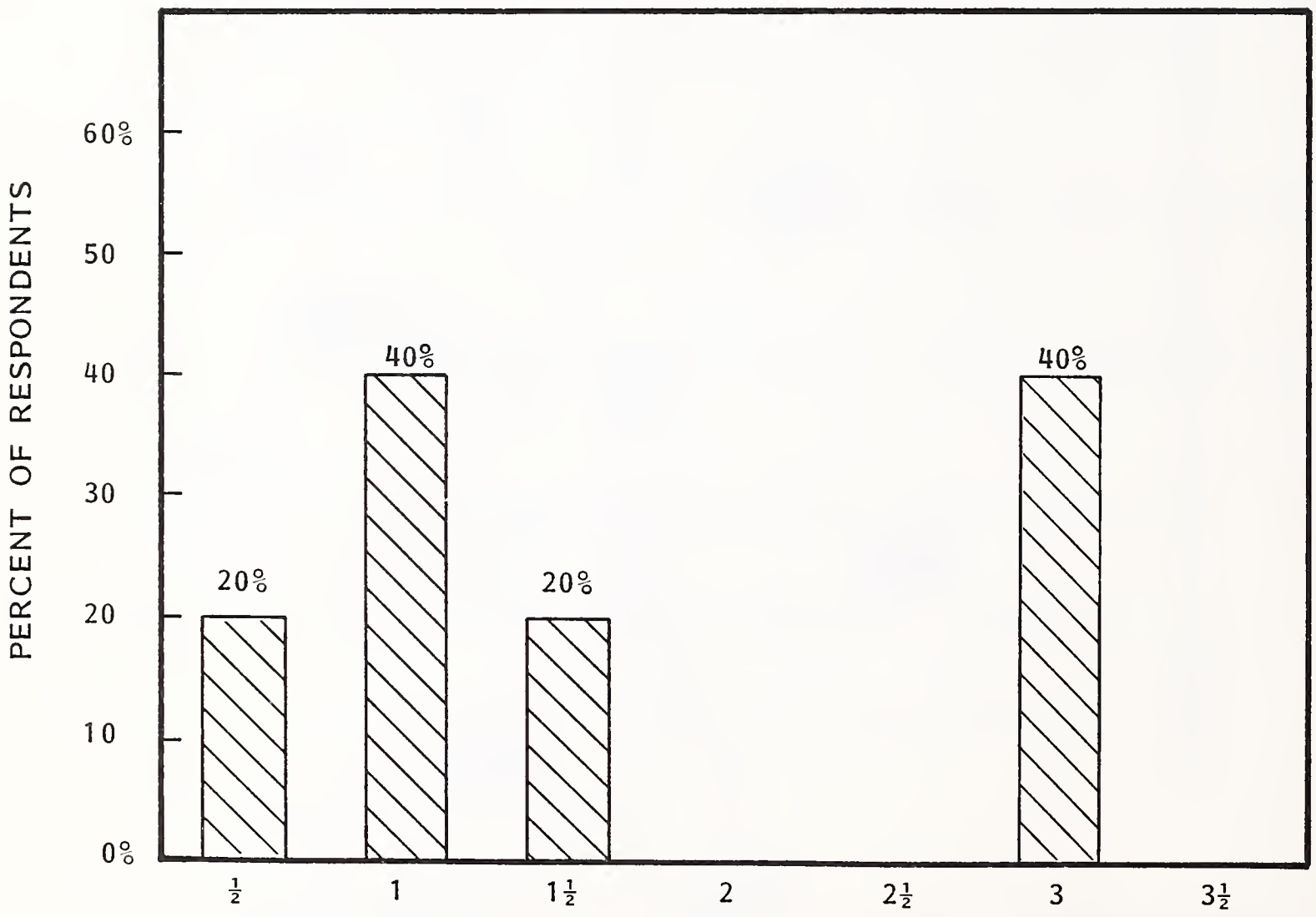


EXHIBIT II-2

LENGTH OF COMET USER EXPERIENCE



TOTAL RESPONSES = 6

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- Cost, though high, is not considered to be a barrier to further EMS utilization. Exhibit II-3 ranks the vendor selection criteria, with "ease of use" being the most important factor.

- Integration of COMET into users' own network systems was highly desirable.

C. GEISCO USER ANALYSIS

- GEISCO does not currently offer an EMS. Some clients use the timesharing service for electronic mailbox functions, but it is both awkward and technically illegal.

- GEISCO users are currently evaluating EMS. The main advantage of EMS is thought to be reduction in paper and delivery costs. Exhibit II-4 summarizes reasons given for investigating electronic mail services.

- No single vendor is perceived by respondents to be more attractive than any other.

- A high usage of EMS is anticipated.

  - Sixty-five to seventy percent of all management and professional employees are expected to use EMS.

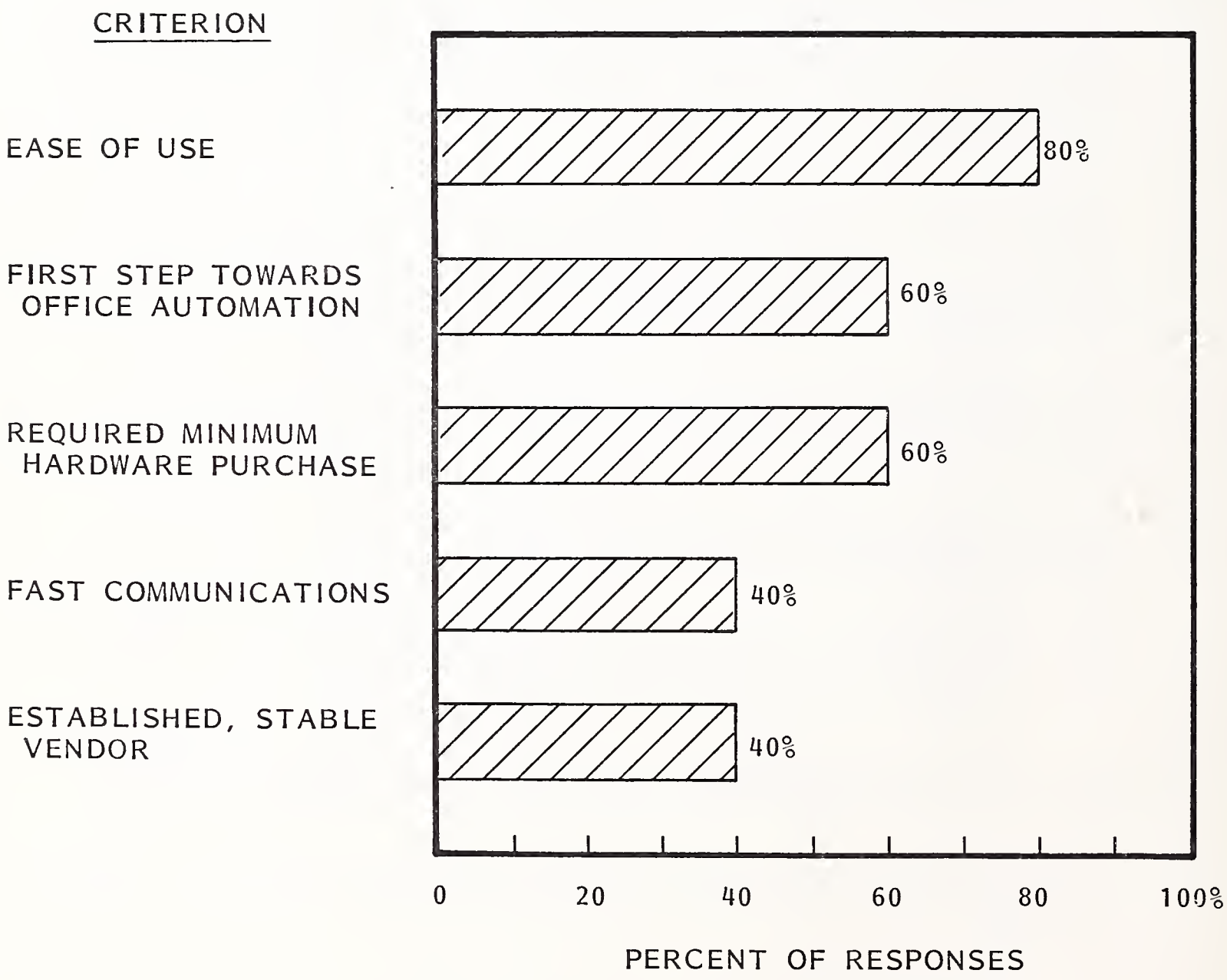
  - Messages will be person-to-person, with no EMS operators required.

- GEISCO clients use a very wide variety and large number of timesharing services.

  - The trend is to reduce timesharing expenditures.

EXHIBIT II-3

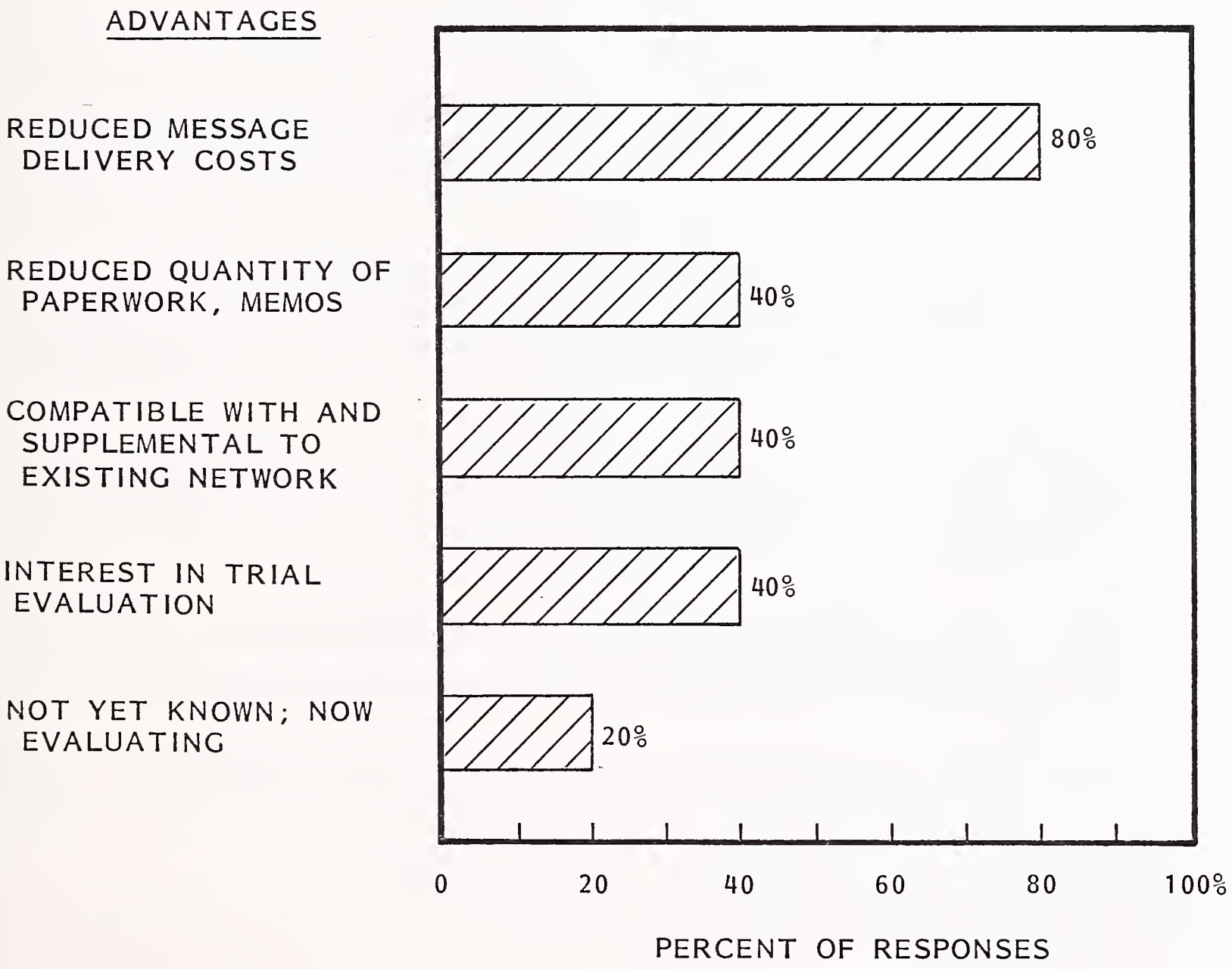
JUSTIFICATIONS FOR INSTALLING EMS



TOTAL RESPONSES = 6

EXHIBIT II-4

GEISCO USERS' PERCEIVED VALUE OF EMS



TOTAL RESPONSES = 5

- Exact levels of timesharing use by organizations are not controlled or documented.

- EMS is expected to be only one part of an organization's overall communications network.

D. RECOMMENDATIONS

- A strategy needs to be developed to approach the EMS market.

  - Consideration must be given to users' needs and perceived benefits of EMS use (e.g., faster message delivery, lower delivery costs, ease of use, etc.).

  - Technical requirements must be established, such as the hardware component of EMS, compatibility of hardware with existing and planned systems, etc.

- End users want to minimize the number of RCS vendors with whom they do business.

  - Existing RCS vendors, with their large applications libraries, have an advantage over telecommunications suppliers in this regard.

  - EMS vendors must plan to offer a full range of products and services to the end user in order to be competitive.

- Computer manufacturers also have a vested interest in EMS because of the hardware component of the system. For example, DEC worked with CCA to develop COMET.

- Computer manufacturers will need to determine other complementary products and services (e.g., office automation) to be offered in conjunction with EMS.

- EMS vendors must develop better cost justification techniques, as prospects and users alike have expressed concern over EMS rates.

E. STRATEGIC RECOMMENDATIONS REGARDING EMS SERVICES

- Current computer terminals must be replaced by equipment that eliminates the typist's keyboard if EMS is to be used by executives in their offices. Voice or touch screen technology may be potential solutions.

- Software and communications packages must be compatible with existing user computers and terminal equipment. This may be impossible in the near term because of a lack of standards.

- Data security is essential for intracompany communications. EMS services are likely to be suspect. The turnkey system's approach, in which users own the system and control it, will probably be the best marketing strategy.

- An immediate attempt to develop and market EMS by RITE or any other vendor is not recommended in the immediate future because:

  - EMS services cannot yet be economically justified.

  - User resistance to changes in operating styles has limited EMS acceptance.

  - Clear standards and legislative requirements in the U.S. for EMS have not yet been established.

- Current product designs are unsatisfactory for management office installation and use.

- The market at present (late 1980) is small and not growing rapidly.

- The potential for future EMS service is not yet clear. However, because this market could possibly be very large in the future, RITE should continue to monitor market and system developments in the U.S.

- Possible joint development of EMS services with existing suppliers such as CCA should be considered. This could help ensure that RITE does not miss a market opportunity, if and when it finally does develop.

III COMET SERVICE DESCRIPTION

III COMET SERVICE DESCRIPTION

A. FUNCTIONAL CHARACTERISTICS

- COMET (COmputer MEssage Transmission) is an electronic message-handling system developed and marketed by Computer Corporation of America.

  - COMET was introduced in March of 1978.

  - COMET operates on Digital Equipment Corporation model PDP-11 minicomputers under the RSX-11M, RSX-11D or IAS operating systems. A minimum of 64K words of memory is required. COMET is written in the MACRO-11 programming language.

  - COMET can be accessed through terminals by a variety of manufacturers, both video (CRT) and hard copy.

  - With a sufficiently large configuration, there is no limit to the number of users supported.

- COMET features English language commands for message preparation, editing, transmission, filing, retrieval and distribution control.

  - All functions are performed using less than 20 one-word commands.

- Any number of subscribers can send or receive messages at the same time.

- COMET terminals need not be dedicated to the system.

- The COMET system allows users to create data files within the computer and to assign them access passwords. Files cannot be used without the required code. The FILE command is used to initiate these files.

  - Users send and receive messages from terminals connected to the computer. Portable terminals allow access in remote locations.

  - Each user has four subfiles into which different types of messages are sent.

    . The UNREAD subfile contains messages received but not read. When the user logs into this subfile and reads the message, it is automatically deleted and entered into the CHRONO subfile.

    . The CHRONO subfile contains a record of all messages sent and received. A record of date and time is also made for each message.

    . The UNSENT subfile contains messages prepared but not yet sent. When the message is transmitted, it, too, is recorded in the CHRONO subfile.

    . The DELETED subfile stores messages read in the last access by the user. This allows an immediate call-up of messages just used. Each time new messages are read, a new set of messages is stored under DELETED.

  - Messages can be picked up or sent from any terminal on the system.

- Messages can be sent without knowing where the recipient is located.

- Unlike the telephone, users do not have to be sending and receiving simultaneously.

- COMET allows the creation, editing, transmission, distribution and filing of messages instantaneously. These are performed through eight primary commands:

  - COMPOSE. To compose a message, the user employs the COMPOSE command. COMET prompts the user for all elements of the message and arranges it as a typed memo. Each message contains six data elements.

    . TO (name of receiver).

    . FROM (name of originator, automatically entered).

    . CC (courtesy copy).

    . DATE (date and time automatically entered).

    . SUBJECT (short purpose or topic of memo, maximum of one line, 80 characters).

    . TEXT (text of message, unlimited length response).

  - ANSWER. The ANSWER command facilitates response to a message in the CHRONO subfile. All required data elements are automatically provided except TEXT. ANSWER provides reference to the original message sent.

  - SEND. The SEND command activates movement of messages from one file to another. Users may preprogram under a given code name a

group of other files or users. For example, by using a distribution list called EXECUTIVES, a user may send a message to a predetermined group.

- FORWARD. The FORWARD command allows a user to take a received message, add additional text and send it along to another user or group of users.

- EDIT. The EDIT command is used to change a message or to add additional text to a FORWARD message.

- READ. The READ command displays messages from any file on the video or hard-copy terminal.

- SCAN. The SCAN command calls-up the one-line, 80-character summary statement filed under SUBJECT that must be provided on all messages.

- RETRIEVE. The RETRIEVE command recalls messages from the CHRONO subfile.

• The greatest benefits of COMET are that:

- The service is not time-dependent.

- It can replace many short memos and telephone calls.

- A single message may be sent to many recipients simultaneously.

- The COMET vocabulary contains less than 20 one-word commands, and is very easy for unsophisticated users to learn.

B. OUTLINE OF THE SERVICE

1. COMPUTER CORPORATION OF AMERICA

- Computer Corporation of America is the vendor of COMET. The company is better known as the developer and marketer of Model 204, a large-scale data base management system.

- The Communications Products Division of CCA specializes in the development and marketing of electronic message-handling systems. This division contributed 9% (approximately half a million dollars) of total 1979 revenues. A full description of CCA, its products and services is provided in Appendix A.

2. HARDWARE/SOFTWARE REQUIREMENTS AND MODE OF DELIVERY

- COMET currently runs on DEC PDP-11 minicomputers under the RSX or IAS operating systems.

  - In 1981, it will be extended to be compatible with IBM Systems 370 and 3033. This will allow the system to operate on the thousands of in-house computers installed in the U.S.

  - The system can be used in combination with word processing terminals and can provide access to TWX and Telex networks.

- CCA offers the COMET system in three ways:

  - As a software product to be installed on a user-owned and already installed PDP-11 minicomputer.

  - As a turnkey system where CCA installs both the hardware and software required to operate the service.

. Eight systems have been installed to date.

- As a remote computing service through links with CCA's computer center in Cambridge, Massachusetts.

  . Over 55 clients access the service via local telephone lines, Telenet and TYMNET. Approximately 1,000 terminals are connected to the service.

  . CCA's client base is growing at a rate of 10% per month.

  . CCA's data center comprises one DEC PDP-10 operating under 10X, two DEC PDP-11/70s operating under UNIX, RSX-11M, and two DEC PDP-11/3s operating under RSX-11M.

- COMET is offered by Canada Systems Group in Canada, by SIMPACT in Italy, and by Radio Suisse in Switzerland.

- Competition to COMET comes from GTE, Tymshare, Compuserve and Scientific Time Sharing.

3. PRICING

- On a remote computing basis, COMET's monthly charges are $100 per organization and $60 per individual subscriber, plus communication charges.

  - Standard usage includes up to nine hours of connect time.

- The software license fee for installing the system for in-house use is $40,000 for a one-time charge, or $1,446 per month for a three-year, full-payment lease.

- Users report that the electronic mail service costs about $1.50 per message when usage and terminal costs are added together.

IV COMET USER ANALYSIS

IV COMET USER ANALYSIS

A. APPLICATION DESCRIPTION

1. SERVICES USED

- The evaluation that follows is based on interviews with seven subscribers of COMET on a remote computing basis.

  - Five of these are current users.

    . One user also has both the Bolt, Bearneak & Newman HERMES electronic mail service and ON-LINE from Open Systems.

  - One respondent has greatly reduced its use of COMET while increasing its use of another system.

  - The final respondent is no longer a user of COMET.

2. USER EXPERIENCE

- User experience with COMET ranged from eight months to three years. Most users had slightly over one year's experience at the time of the interviews.

- Since the system was only introduced in March 1978, this level of experience is not surprising.

3. SELECTION PROCESS

- Reasons given for the installation of the electronic mailbox service included:

  - An attempt to increase office automation. Over half of the respondents (four) indicated this reason.

  - The need for faster, more dependable communication between the central and branch offices.

  - The elimination of problems arising from time zone differences.

  - An attempt to solve a particular business communication requirement.

- Users chose to install the COMET system to fulfill their electronic mailbox needs because:

  - It is easy to use.

  - It is available. (It was the only electronic mailbox system available at the time of the installation.).

  - It provides for a 30-day contract with no commitment to hardware.

  - It is applicable. (An outside consultant determined it to be best for them after comparison with other systems.)

  - Other systems used were too difficult for operators to use ("user-unfriendly").

4. LOCATIONS OF SERVICE

- Four of the six users reported using the electronic mail service within their company, especially between divisions.

  - Four users reported using COMET intrabuilding.

  - Four reported its use between the parent company and subsidiary companies.

  - Four of the six users reported using COMET between the company and outside organizations.

  - One respondent reported using COMET for 15 to 20 international locations, all of which are required by their contract to be within the company. They are currently negotiating for permission to use the service between themselves and their clients.

- Users reported communicating via the COMET system to the following locations:

  - Domestic:

    . Chicago.

    . Houston.

    . New Orleans.

    . New York City.

    . Washington (DC).

    . New Jersey.

  - . California.

- International:

  - . Brussels.

  - . Frankfort.

  - . London.

  - . Paris.

  - . Germany.

  - . Canada.

5. TYPES OF MESSAGES

- All users reported that messages sent intrabuilding were short and informal. Exhibit IV-I shows the number of users sending intrabuilding messages:

  - As replacements for telephone calls.

  - As internal memos.

  - As requests for clarification.

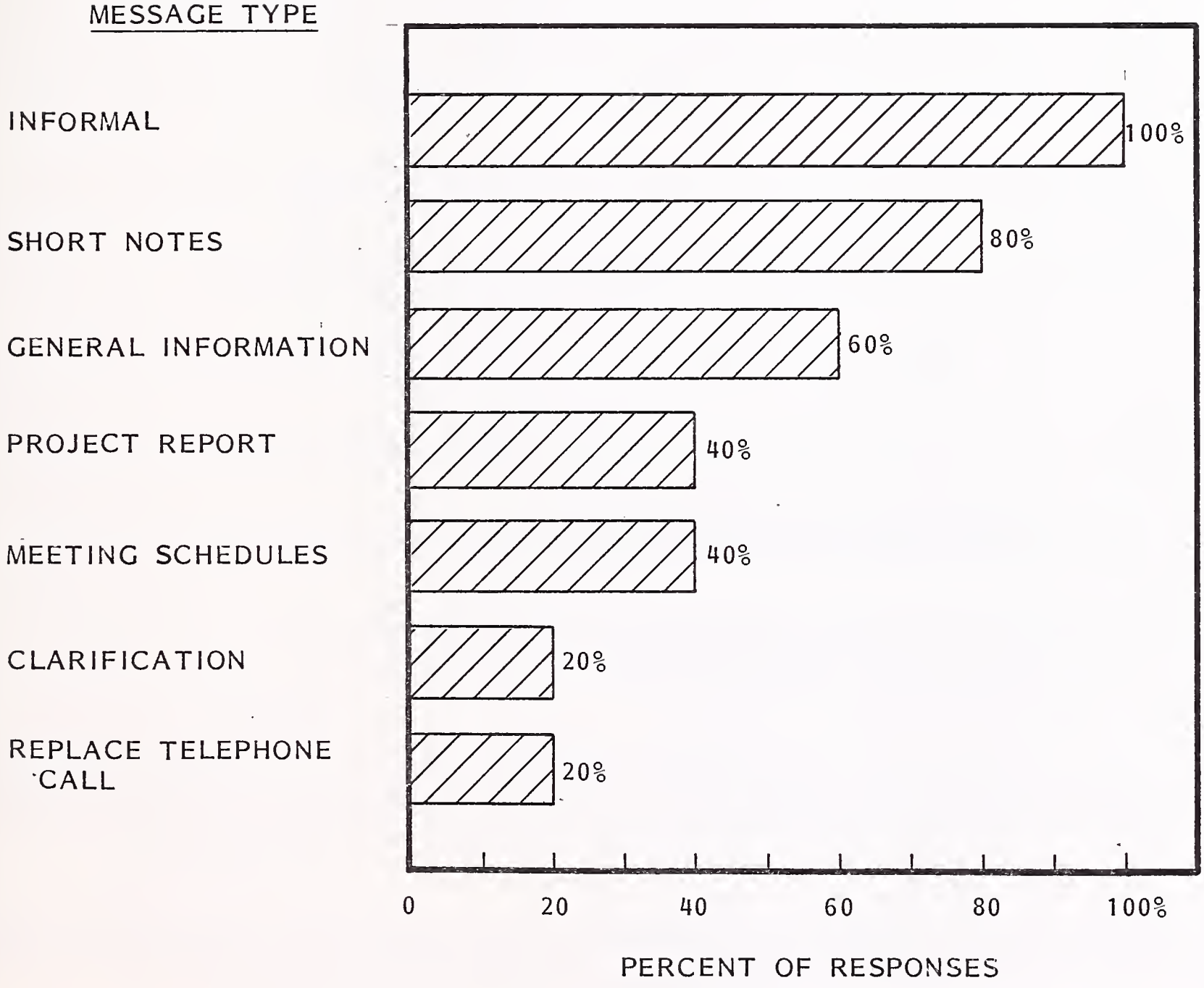
  - For meeting arrangements.

  - For project control management.

- Intracompany messages were also short. One user reported that attempts to send larger documents consistently failed. Specific examples of such messages include:

EXHIBIT IV-1

TYPES OF MESSAGES SENT
INTRABUILDING BY COMET USERS



TOTAL RESPONSES = 6

- Project status reports.

- Intracompany memos.

- General information requests.

- Messages sent to locations in other countries were similar to those sent intrabuilding and intracompany.

- Some users reported that routine (regularly sent) messages are transmitted over the COMET system. Examples of these include:

  - Daily status reports.

  - Project accounting reports.

  - A weekly highlight report.

  - Time sheets.

B. COMMUNICATIONS REQUIREMENTS

1. HARDWARE DESCRIPTION

- The COMET system operates on CCA-owned PDP-11/70 equipment located in Cambridge, Massachusetts. Users reported that the only hardware they had purchased were terminals used for accessing the Cambridge system.

  - Users that were surveyed reported that they were unaware of how much memory the CCA COMET system had available.

  - Users reported having Lear Siegler, Texas Instruments, Lexitron and a variety of other types of terminals connected to the COMET system.

- The number of terminals used for COMET ranged from two to 400, with most users having somewhere between 50 and 150 terminals. Exhibit IV-2 shows that 100% of users had at least one terminal installed and that 20% had as many as 100.

- The rate of transmission is normally 300 on 1,200 baud.

- The number of circuits used per transmission was not known by any of the users, since they subscribed to the service on a timesharing basis.

2. ACCESS TO SYSTEM

- The number of people who had access to the EMS varied by respondent:

  - One user reported having 11 mailboxes and 30 people.

  - One user reported having 120 mailboxes with 150 people.

  - One user reported 30-40 people with access.

  - One user reported only three people using the service.

  - Two of the respondents indicated that there was unlimited access to the service so that they were unable to determine how many people sent messages.

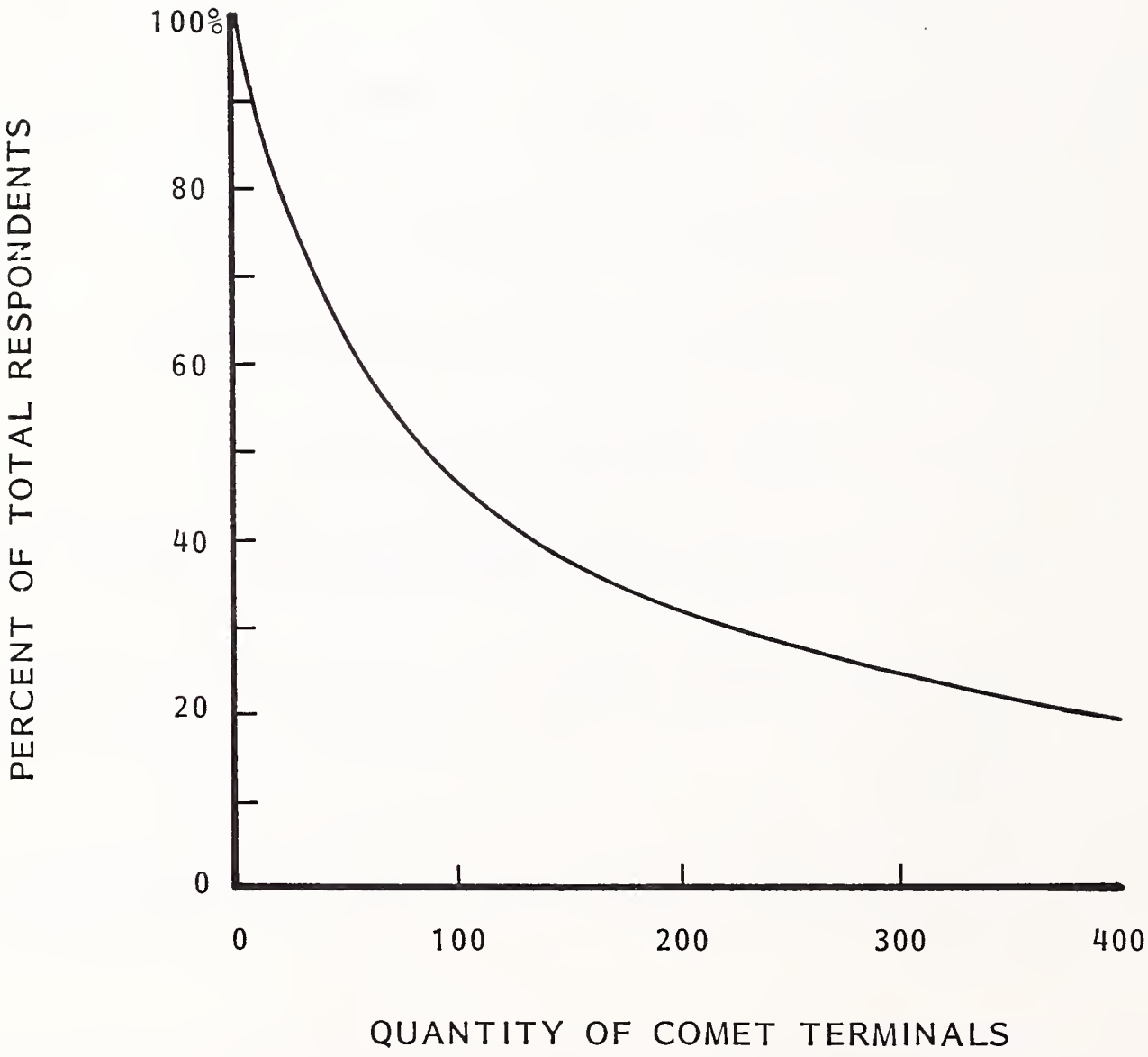
- All of the users except one reported that the system was used by middle management.

  - Two reported use also by executive management, but one reported that use by executive management was a failure.

- Less than 1% of the total number of employees in any of the organizations currently use the electronic mailbox.

EXHIBIT IV-2

QUANTITY OF TERMINALS INSTALLED
BY COMET USERS



TOTAL RESPONSES = 6

- One user expected 85% of the employees to be using mailbox services within five years.

- Another indicated that 33% of middle and upper management were using EMS.

- All of the users both send and receive messages.

- None of the respondents has full-time terminal operators for the COMET service.

  - One user commented that hiring dedicated operators would eliminate the economic effectiveness of the service.

C. EXTENT OF USAGE AND COSTS

1. MESSAGE QUANTITIES

- The number of messages sent by the average user was low (in sharp contrast to the projected amounts of use by GEISCO timesharers in Chapter VI).

  - Four users reported an average of two messages per day per terminal.

  - One user was unaware of how many messages were sent per day per terminal.

  - One user reported as high a daily average as nine messages.

- Most respondents were unaware of a specific maximum length of time for a message to be kept in the mailbox for their companies.

- However, users felt that messages were normally picked up within one working day and that they were held up to two weeks.

- Typical messages are short, consisting of two to three lines or several paragraphs that are less than 60 words total.

- Three users do not know the number of total messages that are sent by their companies on a daily basis. Other responses ranged from a high of 3,000 messages per day to a low of only two or three.

2. MESSAGE COST

- The standard cost for the COMET service is $60.00 per mailbox per month plus communications charges ($7 per hour at 300 characters per second, $10-11 per hour at 120 characters per second) and an account charge ($100).

  - The total cost per month ranges from less than $300 to $18,000 including terminal rental, network and timesharing charges.

  - One user is currently negotiating a bulk discount rate of $20.00 per mailbox per month.

D. PERFORMANCE ASSESSMENT

1. OVERALL SATISFACTION LEVEL

- On a scale of 1 to 5 (1 equals low, 5 equals high), user satisfaction ranged from 2 to 4.5.

  - The average level of satisfaction was 3.0, indicating better than average satisfaction, but far from high grades.

2. GOOD FEATURES

- The main features that are most desirable about the electronic mailbox service are the documentation that is provided and the speed with which messages can be sent and received.

- Specific features that the users liked include:

  - Simple means of introducing office automation.

  - Reduction in disruptive phone calls.

  - Elimination of time zone problems.

  - No hardware purchase required.

  - Message broadcast capabilities.

  - Fun to operate.

3. DESIRED IMPROVEMENTS

- The most common complaints about electronic mail systems by COMET users were related to the physical using of the system:

  - Log-on procedures.

  - Editing difficulties (it is not considered "user-friendly").

  - Typing ability required.

- Other specific features that were mentioned as undesirable were:

  - High cost.

- Lack of any automatic notification of a message.

- Inability to send longer messages.

- Lack of terminal availability in hotels and motels; user must carry his/her own terminal.

- Unattractiveness of terminals themselves.

4. FUTURE PLANS

- Four COMET users plan to add additional new capabilities to the service in the future.

- Users plan to expand the use of this service through:

  - Greater geographic coverage.

  - Greater access to currently qualified persons.

  - Expanding access to more people.

- One respondent estimated that he would have 1,000 mailboxes by 1981. These would be available in all of his branch offices (in 32 countries).

  - Another user said the use of electronic mailbox was being pushed throughout the company.

E. OTHER COMMUNICATION SERVICES

1. CURRENT SERVICES BEING USED

- Three of the users are currently employing TYMNET, SPCC and Telenet. Two users declined to indicate what other services they were using.

- Specific services were chosen because they:

  - Were recommended by a hardware supplier (Lexitron).

  - Made facilities as close to the ultimate user as possible (ease of use).

- Two users said that either the reasons for choosing specific services were too great to list, or they could not list them.

- The use of these services has been satisfactory to the end users.

  - However, some users indicated that packages need to be made easier for non-EDP professionals to use.

- Most of the respondents did not feel that their use of an EMS had affected these other systems.

  - One respondent felt that the EMS had increased their use by being a "window on the world"; in other words, through using the terminals for the EMS, users became more willing to try other means of automation.

    . Eighty percent of these EMS users had not previously used a terminal.

    . Pressure is now being applied to provide other automation tools.

2. TIMESHARING APPLICATIONS

- Four of the five respondents are currently using timesharing services. One respondent has his own internal system.

- Applications of timesharing services include:

  - Specialized application packages.

  - Financial planning.

  - Document storage and retrieval.

  - Scientific packages.

  - Data bases.

- Users reported using Lockheed, Boeing and "most major vendors" for timesharing services.

  - Specific knowledge of all of the timesharing services that are being used were not known because various departments in the companies are able to purchase timesharing services for their specific requirements. These purchases are not necessarily centrally controlled or reported.

- The vendors of timesharing services are chosen by their ability to fill a specialized need.

  - Individuals who select timesharing services for purchase are aware of what capabilities are available from most major timesharing vendors.

  - Knowledge of specific packages is obtained through professional literature and industry conferences.

- Users are generally satisfied with their timesharing services; however, they indicate that these are often not sufficiently easy for the unsophisticated user to access and that the cost and security risk using timesharing services is high.

3. IMPACT OF COMET ON OTHER SERVICES

- The use of the electronic mailbox system (EMS) has caused an increase in the use of specialized communications because end users now have terminals that are available and they no longer fear interacting with a computer-based system.

  - Eighty percent of the EMS users in one company had not previously used the computer terminal.

  - In another company, 25% of first-time mailbox users were also first-time timesharing users.

- EMS will continue to increase the pressure to provide additional specialized communications tools to the end users.

- Electronic mailbox service has had its most dramatic impact on the use of timesharing services.

  - Electronic mail service was seen as the most useful application of timesharing, but should be integrated with other timesharing services.

  - One respondent went so far as to state that EMS is only successful as an application of timesharing - that it will fail if it stands alone.

- All of the end users reported that they were using some communicating word processors for EMS terminals.

- Four of the users have facsimile machines in addition to word processing terminals.

- Most users have approximately 50 communicating word processors currently installed.

  - One user projects 500 additional communicating word processors in 1981.

  - Most users anticipate a very large increase in communicating word processors in the near future.

- With regard to new communications networks such as Satellite Business Systems (IBM), Xten (Xerox) and ACS (AT&T), only one user was unaware of any planning for these networks.

  - Two of the respondents indicated that they would consider the use of the IBM system.

  - Two indicated that they would be interested in the Xerox system.

  - Two indicated that they would be looking at the AT&T system.

    . One of these two respondents is currently creating his own international network that will be able to connect into any of the IBM, Xerox or AT&T systems as required.

- Two of the six EMS users indicated that the electronic mailbox represents a very negligible portion of their total communication network service costs.

  - One respondent felt that EMS is a basic growth area. He intends to install terminals at every professional desk by 1985.

V CROSSFILE PRODUCT DESCRIPTION

V CROSSFILE PRODUCT DESCRIPTION

A. CURRENT STATUS

- General Electric Information Systems Company (GEISCO) is the largest timesharing company in the U.S., with access ports in over 500 cities.

- Some GEISCO users are using their system as an inexpensive way to send electronic mailbox messages. However, this is theoretically an illegal use of the timesharing network.

- GEISCO has had an electronic mailbox system for internal use for approximately ten years. This system is known internally as CROSSFILE.

- GEISCO recognizes that there is a potential market opportunity to use its timesharing networking capability to enter the electronic mailbox market, but it would have to become a full-fledged value added carrier.

  - The existing system is very awkward for unsophisticated users to interface.

  - CROSSFILE would have to be considerably upgraded to be a viable EMS offering in the U.S. market.

- GEISCO is known to be field testing an upgraded CROSSFILE system with five or six current timesharing customers. The identity of these trial locations and organizatons has not been revealed.

B. POTENTIAL

- The upgraded version of GEISCO's internal CROSSFILE system is called GE-FILE.

- GEISCO declines to estimate if or when the GE-FILE will be made publicly available.

  - However, INPUT believes that the service will be offered sometime in 1981, if at all, since the evaluation has been continuing for some time.

- It is anticipated that GE-FILE would be only for domestic users.

  - The subscribers to GEISCO services would clearly be early candidates for such a system.

  - GEISCO would be able to convert a number of its timeshare customers to its value added services from the very beginning, since some of these customers are using the service for this application already.

- Because GEISCO has access ports in so many cities, users would have immediate advantages for selecting the GE-FILE over potential competitive systems.

- GEISCO has the industry reputation and financial strength to carry forward the successful development of GE-FILE if this becomes a corporate objective.

VI GENERAL ELECTRIC INFORMATION SERVICES COMPANY USER ANALYSIS

VI GENERAL ELECTRIC INFORMATION SERVICES COMPANY USER ANALYSIS

A. ATTITUDE TOWARD ELECTRONIC MAILBOX SERVICE (EMS)

1. CURRENT EMS USE

- INPUT interviewed ten GEISCO users. Of these respondents:

  - One is using an EMS on a trial basis.

    . At the time of the interview, the company was six weeks into its use as part of a long-range investigation of office automation.

  - One has created its own internal EMS-like system.

    . This company wished to "try out" the idea before investing in a commercially available system.

  - Three are not currently using an EMS, but are interested in its possibilities for their companies.

    . One is involved in a feasibility study.

    . Another is setting up a pilot project with the intention of eventually utilizing EMS corporatewide.

- Five do not have such a service and are not interested in adding one.

  . Three of these indicated very little knowledge of EMS (what it was, what it could do, how they might use it, etc.). When it was explained, one respondent indicated a desire to investigate further.

2. EMS ADVANTAGES

- The GEISCO users have different opinions as to the advantages of an electronic mailbox system. These include:

  - Ease of communications.

    . Speed (timesaving).

    . Shortrun messages.

    . Phone conversations supplemented.

  - Documentation of "quickie" messages.

  - Reduced levels of paper consumption.

  - Reduced costs of mail carrier services. (One respondent reported its current costs at $1.5 million per year, with an expected reduction of 50-75% through the use of EMS.)

3. EMS SHORTCOMINGS

- The major current EMS shortcoming appears to be that the user must buy a particular vendor's system rather than being able to interface with existing end user systems already in position.

- There is some concern over improper use of such a system once it is installed; in particular, that it would be used in the function of other types of communication systems rather than its own.

  - One respondent felt that regional office users might become receivers only, in which case the material could be handled as effectively via a data base.

4. VENDOR SELECTION

- The one respondent with an EMS had chosen it because it was available at the specific locations in which the company was interested in using it.

- Those users interested in EMS had no selected vendors or preferred systems at the time of this study.

  - One respondent said that vendor selection would be determined as a result of its ongoing study.

- Users of timesharing services did not feel that the vendors they were already using would necessarily be more desirable for their possible EMS requirements.

B. COMMUNICATIONS REQUIREMENTS

1. LOCATION OF SERVICES

- Those respondents either using or interested in using EMSs demonstrated great flexibility in projecting the extent of usage, seeing its applicability intrabuilding and intracompany as well as between parent and subsidiary.

- They also indicated diverse use geographically, both international and domestic.

- The companies queried indicated these domestic areas as desired communication locations for EMS:

  . Roanoke (VA).

  . Dallas and Houston (TX).

  . Oakland (CA).

  . Bismarck (ND).

  . Salinas (KS).

  . Grand Rapids (MI).

  . Pocatella (ID).

  - International locations were Hong Kong and Rotterdam.

2. TYPES OF MESSAGES

- There are basic similarities in the types of messages that prospective users feel would be sent via EMS.

  - Most envision short, general information messages, in the nature of "quickie" memos.

- There was little differentiation between the types of messages that would be sent intrabuilding as opposed to domestic.

  - Again, messages would be short and general in nature wherever they were being sent.

INP

- The nature of the business of respondent companies dictated certain messages common to that type of company:

  . Marketing bulletins.

  . Correspondence practices.

  . Insurance underwriting policies.

  . Contract information.

  . Freight forwarders acting as agents, including messages to shipping docks and local port facilities.

- Only one respondent spoke of the use of EMS for routine (regularly sent) messages.

- Person-to-person messages are considered the primary EMS application.

3. ESTIMATED USAGE

- Timesharing respondents believe that EMS will become available to large numbers of people. Estimates range from 200 to 4,000 individuals.

  - The two pilot programs are being conducted with 16 and 25 people, respectively.

- All respondents believe that EMS should involve middle and upper management plus professional and technical personnel.

- Estimates of the percent of employees who will use EMS range from less than 1% to 65-70% of the total employees in management and professional categories.

- None of the respondents thought that messages would be receive-only. They indicated that two-way communication is a requirement for EMS.

- Three respondents indicated they would not have full-time terminal operators for EMS. One indicated that the company would hire full-time operators, while another respondent felt this would be determined by its pilot study.

- The volume of messages that GEISCO users anticipate for EMS is generally higher than that actually experienced by existing COMET users.

  - Usage is expected to be at the level of 1,000 bulletins per year (three pages, 45 lines), or 11 million characters per year per office, possibly requiring the staffing of two shifts to handle the communications requirement.

  - One respondent felt that the level of two messages per person per day would be the realistic level of use.

C. CURRENT COMMUNICATIONS SERVICES

1. SPECIALIZED SERVICES

- Three respondents have their own private network. These are leased-line and microwave satellite systems.

  - One respondent has a variety of specialized communications circuits to every major city in the U.S.

  - The trend is to use private, internal communications networks rather than to depend on publicly available services.

- Since public services are either nonexistent or in the process of being phased out, the reason for choosing these services in the first place was not reported.

  - Past users of public services have found these satisfactory, relative to what was available at the time.

- The use of electronic mailbox will force a decision to either expand leased lines or to add VANs.

  - The impact will be gradual, not dramatic.

2. TIMESHARING SERVICES

- A wide variety of timesharing service vendors are being used. Specifically identified were:

  - Computer Sciences Corporation, National CSS, Boeing Computer Services, MacDonnell Douglas Automation, Tymshare, Automatic Data Processing, Service Bureau Corporation, Control Data Corporation and United Computing Systems.

- These timesharing services are in addition to existing General Electric Information Services.

- The current levels of timeshare services are being reduced. However, ongoing utilization is anticipated for:

  - Specialized software.

  - Data bases.

  - Quick and inexpensive technical problem solving.

- The original bases for choosing these timesharing vendors, as reported by the respondents, indicate a haphazard approach to overall planning - a situation that is changing.

  - Some vendors were selected by individual users within a company who negotiated their own contracts with the vendors.

    . The approval methods are now tighter within that organization, and some timesharing services are being phased out.

  - Most users have no standard selection process for timeshare applications.

- All of the users expressed satisfaction with existing timeshare services.

- Electronic mailbox service is not expected to affect the use of timesharing services for the applications named.

3. USE OF FACSIMILE AND COMMUNICATING WORD PROCESSORS

- The respondents currently use facsimile machines. Four are also using communicating word processors.

  - The number of facsimile machines was unknown at two of the organizations, and two others each reported from three to 25 machines for FAX.

  - The number of communicating word processors ranged from a low of 47 to over 200 in each organization.

D. FUTURE REQUIREMENTS

1. USE OF NEW COMMUNICATIONS NETWORKS

- All the respondents indicated that they had no current plans to use the IBM Satellite Business System network, the Xerox Xten, or the ACS (AT&T) system.

  - Two respondents are considering the future use of such networks as part of pilot projects.

  - Another respondent was unable to comment on any plans for new communications networks.

2. COST OF EMS

- Timeshare users do not anticipate that electronic mailbox usage will cause a decrease in communication network service costs.

  - One respondent estimated that EMS will amount to 10-15% of total communications cost.

  - Another respondent believed that mailboxes will be used to verify, but not to replace, phone calls.

VII ANALYSIS AND CONCLUSIONS

VII ANALYSIS AND CONCLUSIONS

A. KEY ISSUES RELATIVE TO EMS

1. SIZE OF ORGANIZATIONS MOST INTERESTED IN USING EMS SERVICES

- There are currently 15 users of COMET on a service basis. Most of these firms are in the very large category, with over $1 billion per year in revenue. They are primarily in the manufacturing, insurance, communications and government industries. All are international in scope, with offices in most parts of the world. Users stated that factors such as problems with time zones, effects of slow communications and overall corporate growth made an EMS system very desirable.

- All these companies have much larger in-house computer capability than Computer Corporation of America has, yet each chose to use the COMET system on a network service basis. This was primarily due to the lack of good software available for their in-house computers. Most were experimenting with an EMS service and did not wish to make the large investment required to bring up an internally designed system without knowing whether the system would be accepted. The service was typically adequate for current EMS needs, but not acceptable for long-range office automation plans.

2. FUNCTIONAL GROUPS WITHIN ORGANIZATIONS PURCHASING EMS SERVICES

- INPUT's feeling is that the groups deciding to try the EMS service were not the traditional EDP people looking to provide automation to the heavily manual tasks in the company. EMS usage was typically looked at by, and designed for, the use of upper management. It was typically the first step into what has been called integrated office automation or "office of the future." The tasks of increasing corporate and executive productivity as well as cutting the cost of office services is typically the task of the groups other than those responsible for the implementation of data processing.

  - These groups include office administrators, corporate planning staffs and managers of corporate communications facilities.

- Most users appear to have purchased EMS services not so much on the basis of real need or economic justification, but for experimental analysis of potential value or for testing management's acceptance of office automation methods and equipment.

3. NEED FOR EMS SERVICES

- Current EMS users seem to be interested in getting more people within their organizations to use the service. However, the current usage levels are very low and the number of subscribers and users has grown relatively slowly. INPUT believes that there is no immediate need for EMS due to:

  - Lack of economic savings.

  - Unwillingness to modify current methods.

  - Inability to easily use the system.

- Minor number of current users, they restricted levels of communications potential.

4. REASONS FOR SLOW ACCEPTANCE OF EMS SERVICES BY EXECUTIVES

- The greatest problem with EMS that was described by users concerned the friendliness of the machines to the user. Systems are usually available to middle- and upper-level executives who are not familiar with the operation of a keyboard or data terminal.

  - Though the system is "user-friendly" to an experienced keyboard user, it is still hostile to an executive who views typing as a secretarial task.

  - Management does not feel that the editing or log-on procedures are that easy or quick.

  - If these have to hire clerical personnel to do the data entry for them, the savings in cost through EMS is eliminated.

- Alternatives to these problems may involve the design of specialty terminals for the use of EMS executive users. A more compact and stylish keyboard would help overcome the fear of clerical tasks. Having the terminal fit the decor of the office and look modern would overcome much irritation with the device.

- Ultimately the integration of digital voice transmission and EMS may be the answer. By being able to store a voice message in a computer memory, the benefits of EMS transmission and the ease of voice communication are combined. If some way of making a hard copy of a digital voice message could be developed, many problems would be solved.

5. TYPES OF USERS MOST INTERESTED IN EMS SERVICES

- The greatest success of EMS appears to be with clerical employees who are used to typing memos and those few managers and executives who have the

time to experiment with a new tool as a concept that does not change or threaten their current ways of performing their job functions.

- The unique characteristics that make them interested are:

  - Avoidance of time zone limitations.

  - Proof that message was sent at a certain time.

  - Elimination of message interruptions or delays in sending.

6. COST SENSITIVITY OF USERS TO EMS SERVICES

- Users do not appear to be using EMS services to reduce message costs since it appears that conventional telephone and postage communications methods are much less costly than EMS service expenses. Therefore, the cost sensitivity is low, but could be high if EMS became less expensive than other communications methods.

- The service method of EMS implementation is the least expensive for limited, trial usage. This may be why large organizations have purchased CCA's service when they are internally capable of developing their own system. They want to prove its need before committing internal resources to proprietary EMS development.

7. FUTURE OF EMS AMONG LARGE COMPANIES

- INPUT believes that if EMS proves desirable on a trial basis, large companies will probably develop their own internal system and cancel their outside EMS service subscriptions. This will occur because of:

  - Greater security of internal network.

- Compatibility with existing hardware.

- Ease of existing data base and software interfacing.

- Unwillingness to be dependent upon outside vendors for communications capability.

8. EFFECT OF ACCEPTANCE AND IMPLEMENTATION OF "OFFICE OF THE FUTURE" AND "ELECTRONIC OFFICE" ON THE MARKET FOR EMS

- INPUT believes that as office equipment with built-in communications capabilities becomes available and acceptable to end users, the need for EMS services may diminish for large organizations. The situation may be similar to the data processing service bureaus that were strong when end users could not afford to own or staff their own data processing department. But as they became more dependent upon DP, and as the equipment became less costly, they developed their own internal capability to replace the service bureaus.

9. FUTURE OF EMS AMONG SMALL- AND MEDIUM-SIZED COMPANIES

- Small- and medium-sized companies will have less need to send information to many offices and locations, so the need for EMS will not be as important for these organizations. However, INPUT believes that the office equipment of the future will have built-in capabilities for electronic message transmission (such as communications options for word processing equipment). This option, together with standard transmission protocols, will enable small firms to use their own equipment for EMS as the need arises. They will need to purchase the software packages that may be required to utilize the communications options.

10. IMPACT OF NEW SERVICES SUCH AS ACS, XTEN AND SBS

- As new services such as ACS and SBS become widely used, the concept of EMS will be increasingly accepted as a communications method. The use of

electronic mail may become mandatory for some organizations to remain competitive where rapid data transmission is a major factor in their business operations.

- INPUT believes that the major impact of new electronic message systems and products will be to increase the demand for EMS services for those organizations that cannot economically justify their own private network system.

II. REASONS FOR SLOW DEVELOPMENT OF EMS

- Computer-based message systems are generally oriented toward applications involving short messages. Communicating word processors tend to be used to transfer the entire contents of longer documents, with control and formatting codes intact.

- Today the telephone is being used for short messages because it is easier to use than terminals. Communicating word processors are not in widespread use because:

  - Most users of communicating word processors consider this application to be in the experimental stage.

  - Even for companies using communicating word processors, only a small minority of the workstations are operating in a communications mode.

  - Users of word processors are most often not ordering the communications option when they take initial delivery of the systems.

  - There is a high level of concern among word processing users in regard to the incompatibility of communications protocols of different vendors.

  - Cost savings in terms of hard dollars have been difficult to prove. Savings such as increased management productivity or increased speed

of information flow cannot be clearly determined. However, most management insists upon hard dollar justification for installing any new communications system.

- Concern for data security inhibits executive use of EMS. This is particularly true where sensitive company data must be transmitted through outside service organizations.

12. NO EVIDENCE OF A "BUY-AMERICAN" BIAS FOR EMS PRODUCTS

- INPUT believes that most American firms will buy the equipment and services from whatever source provides the highest-quality, most acceptable and most easily cost justified products. The current political climate in the U.S. is towards free trade and against protectionist policies. Most consumers agree with this policy, as evidenced by the high levels of acceptance of foreign automobiles in preference to U.S.-manufactured products.

13. PROBABLE LEGISLATIVE IMPACTS ON EMS

- The Communications Act of 1934 empowered the Federal Communications Commission to decide what regulation, if any, was required in the U.S. communications industry.

- Until 1980, all services were classified as either voice or data processing. All wire services were regulated. All data processing services were not.

  - Voice services were defined as all services offering primary or value added services. Exhibit VII-1 shows the list of regulated services.

- In 1980, as part of its Second Computer Inquiry, the FCC deregulated much of the communications industry. Services are now classified as either Basic or Enhanced Services.

EXHIBIT VII-1

MAJOR SUPPLIERS OF COMMUNICATIONS SERVICES

- TRADITIONAL LEADING COMMON CARRIERS:
  - AT&T AND ITS BELL SUBSIDIARIES
  - GTE (GENERAL TELEPHONE AND ELECTRONICS)
  - UNITED TELECOMMUNICATIONS, INC.
  - CONTINENTAL TELEPHONE CORP.
  - CENTRAL TELEPHONE AND UTILITIES
  - WESTERN UNION (TELEX AND TWX SERVICES)
- SPECIALIZED COMMON CARRIERS:
  - SPCC (SOUTHERN PACIFIC COMMUNICATIONS CO.)
  - MCI COMMUNICATIONS CORP.
  - UNITED STATES TRANSMISSION SYSTEMS (USTS) (SUBSIDIARY OF ITT)
- SATELLITE COMMUNICATIONS:
  - AT&T COMSTAR
  - RCA SATCOM
  - WESTERN UNION WESTAR
  - AMERICAN SATELLITE CORP. (ASC)
  - SATELLITE BUSINESS SYSTEMS (SBS)
  - XEROX/WESTERN UNION INTERNATIONAL (XTEN)
  - SPCC
  - HUGHES
- VALUE ADDED AND PACKET-SWITCHED PUBLIC DATA NETWORKS:
  - TYMNET
  - TELENET
  - GRAPHNET
- INTERNATIONAL RECORD CARRIERS (IRCs):
  - RCA GLOBAL COMMUNICATIONS
  - ITT WORLD COMMUNICATIONS
  - WESTERN UNION INTERNATIONAL
  - TRT TELECOMMUNICATIONS
  - FTC COMMUNICATIONS

- Basic Services would be regulated by the FCC. Vendors in this category are AT&T and GTE only.

- Enhanced Services would not be regulated. Any communications vendor can now offer services without FCC approval. AT&T and GTE may also offer enhanced services through separately funded subsidiaries.

- This FCC ruling was tested in August 1980 when GTE-Telenet filed for a tariff to offer an electronic mailbox serivce. The FCC rejected the tariff request as unnecessary, thus supporting its previous decision. Telenet may offer its EMS without FCC approval.

- This decision opens the door for other vendors to offer EMS. Until this decision, data processing service companies could not offer EMS except through separate subsidiaries (such as Tymshare/TYMNET). Now any vendor offering network services may offer an EMS without regulation.

  - The leading computer services companies with extensive networking capabilities that might enter the EMS market include:

    . Automatic Data Processing.

    . Boeing Computer Services.

    . Computer Sciences Corporation.

    . Control Data Corporation (Cybernet).

    . General Electric Information Services Company (Mark III).

    . National CSS.

    . Tymshare (TYMNET).

B. COMET USER ANALYSIS

- There are 15 companies using the COMET service. Of these, seven were interviewed by INPUT for this study. These included companies involved in government, communications, banking and transportation.

  - Most are classified as very large companies (over $1 billion per year in revenue).

  - Most are international in scope, with offices in various parts of the world.

- The positions held by the various respondents themselves include:

  - Administrative Assistant, Telecommunications Department.

  - Project Engineer, Computer Communications Development Area.

  - Senior Project Analyst.

  - Assistant to the Director of Administration.

  - Assistant Vice President.

  - Office Automation Manager.

  - Head of Data Processing.

- By interviewing people in this cross-section of management levels, INPUT feels that it is able to present a more complete and objective analysis of COMET users.

- It is interesting to note that the higher levels are more supportive of EMS.

- It is also interesting that the only respondent to express a personal dislike of EMS was the Head of Data Processing.

- It is INPUT's feeling that EMS was introduced into the user companies by upper management as a management tool, rather than an automation or communications tool.

  - EMS is being used to introduce the office of the future concept into the respondent companies.

  - One very strong supporter of both electronic mailbox service and office automation calls EMS a "lifestyle incentive"; it is his estimate that the use of this service can save a minimum of 30 minutes per day per person.

  - INPUT attributes EMS's lesser degree of success in some user companies to its introduction by upper management. It is seen by lower levels as a "toy" that does not live up to its practical billing.

- The COMET users have in-house computer capability larger than that available through Computer Corporation of America's system, yet each uses COMET on a network service basis.

  - In part, INPUT feels this is explained by the users' initial intention to "try out" the service without any involvement of their own equipment or purchasing of other hardware.

  - INPUT also feels that this situation was necessitated by the lack of good software available for their in-house computers when they began to use EMS.

- All electronic mailbox service users object to the primitiveness of the system; there is a strong dislike of the typing requirement. This objection must be viewed from two perspectives:

  - First, many users and potential users either don't know how to type, don't want to learn how to type, or won't type.

  - Second, there is still a belief that sending messages is to be done by a secretary.

- Other objections refer to the log-on procedure as too long or too unreliable, and to the editing procedures as too difficult.

  - The respondent who is an engineer is very definite in his opinion that the keyboard itself must be redesigned.

- All users report that the cost of EMS currently represents a negligible percentage of their total communications costs.

C. GEISCO TIMESHARE USERS

- INPUT conducted interviews with ten users of GEISCO timesharing services. Again, most respondent companies are in the very large category (over $1 billion per year in revenues).

- Of these ten GEISCO timeshare users, three were unaware that such a service as electronic mailboxes existed.

  - When given further information explaining the function of EMS, two respondents demonstrated a total lack of interest in both the idea and its incorporation by their company.

- One respondent, on the other hand, was so intrigued by the concept that she intends to research it further.

- Two of the interviewees demonstrated a paradox in their thinking.

  - Neither company has such a service; neither is considering its implementation.

  - However, one respondent is currently involved in redesigning the company's management information systems and the other feels that there will be a need within 12-18 months for a better communications system for contacting its European offices.

- One of these users is six weeks into a test of EMS that is being done as part of a long-range investigation of office automation.

  - This user's experiences and comments very closely parallel those of the COMET users.

- Another respondent is developing plans to incorporate more office automation, but is not specifically thinking in terms of EMS.

  - Since they own their own hardware, any thinking in terms of EMS will be in terms of an addition to their equipment, not as timesharing.

- The remaining three GEISCO timeshare user respondents are all involved in either studies or pilot projects of EMS.

  - It is INPUT's opinion that these users are not clear in their own thinking as to the functions of EMS.

    . EMS is seen as backup or verification of telephone communications rather than as a separate and distinct means of transmitting messages.

- Their thinking is small-scale in terms of number of employees with access to the system and type of employee (i.e., function within the company).

- Conversely, their thinking is large-scale (and considerably greater than the actual degree of use demonstrated by the COMET users) in terms of size and number of messages to be sent.

- None of these respondents was able to project what percentage of communication costs would be represented by EMS.

D. CONCLUSIONS BASED UPON COMET USER SURVEY

- EMS service has yet to be proven economically justifiable for most business needs.

- Executives and many managers refuse to operate a keyboard instrument or have a terminal installed in their office.

- Legislative restrictions and uncertainty have prevented many potential EMS vendors from entering the market.

- The current U.S. market for EMS is very small: less than $100 million annually. It is not growing rapidly yet.

- Where EMS has been tried, users have not found the concept particularly beneficial, even when cost justification is not required.

- The current computer terminal design is unwieldy for non-typists. Word processors are not being used for communications purposes in most cases.

- While non-users of EMS services are interested in the concept, few are willing to purchase systems.

- There are many potential U.S. vendors such as GEISCO, IBM, Xerox and others, yet only a few small companies have actually offered the service, and acceptance of their service has been limited and slow.

- The major market demand for EMS services appears to be greatly over-estimated by the popular literature. While INPUT believes that there is a place for EMS services, the need and economic justification is at least several years from late 1980.

- The current COMET EMS users are all large firms in a few major industries. Exhibit VII-2 portrays the industry categories and size distribution for all 15 existing COMET subscribers.

EXHIBIT VII-2

COMET USER CHARACTERISTICS

INDUSTRY	NUMBER OF USERS			SIZE*		
	1	2	3	LARGE	MEDIUM	SMALL
CHEMICAL AND PETROLEUM			X	2	1	
COMMUNICATIONS			X	3		
INSURANCE		X		2		
BANKING		X		2		
U.S. GOVERNMENT		X		2		
CONSTRUCTION	X			1		
BUSINESS SERVICE	X				1	
MEDICAL	X					1

*LARGE = >$1 BILLION IN ANNUAL SALES
MEDIUM = $1 BILLION TO $100 MILLION IN ANNUAL SALES
SMALL = <$100 MILLION IN ANNUAL SALES

TOTAL NUMBER OF USERS: 15

APPENDIX A: COMPUTER CORPORATION OF AMERICA - COMPANY HIGHLIGHT

COMPANY HIGHLIGHT

COMPUTER CORPORATION OF AMERICA
575 Technology Square
Cambridge, MA 02139
(617) 491-3670

Dr. Thomas Marill, President
Private
Total Employees: 100
Total Revenues Fiscal Year End 12/31/79: $5.45 Million

THE COMPANY

- Computer Corporation of America (CCA) was established by its president, Dr. Thomas Marill, in 1965. The company specializes in the areas of data base management, distributed data systems, computer networks, computer message systems and mass memory utilization. Products and services are developed as a consequence of research and development activities performed for the federal government and the company.

- CCA ended fiscal year 1979 with $5.4 million in revenues, a 55.4% increase over 1978 revenues of $3.5 million. The company projects a 38% growth rate for 1980, anticipating revenues of $7.5 million.

- A five-year financial summary follows:

COMPUTER CORPORATION OF AMERICA
FIVE-YEAR FINANCIAL SUMMARY
($ Thousand)

ITEM \ FISCAL YEAR	1979	1978	1977	1976	1975
Research-Development	$ 3,510	$ 2,450	$ 1,470	$ 1,190	$ 1,750
. Percent increase (decrease) from previous year	43%	67%	24%	(32%)	N/A
Database Products	1,470	920	650	410	340
. Percent increase (decrease) from previous year	60%	42%	59%	21%	N/A
Communication Products	470	140	130	0	0
. Percent increase (decrease) from previous year	236%	8%	N/A	N/A	N/A
Total Revenues	$ 5,450	$ 3,510	$ 2,250	$ 1,600	$ 2,090
. Percent increase (decrease) from previous year	55%	56%	41%	(23%)	N/A

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- In 1980, the company projects that research activities will account for $4 million of total revenues; data base products, $2 million; and communications products, $1 million.

- The total number of employees has grown from 78 in 1978 to 100 in 1979. Employees are categorized as follows:

- Research and development	39
- Data base products	26
- Communication products	13
- General and administrative	22
TOTAL	100

- Major competitors of the company include GTE, IBM, Tymshare, Software ag of North America, and Cullinane Corporation.

KEY PRODUCTS AND SERVICES

- Research and development activities center around advanced software technology development projects performed for the federal government. This activity within CCA continues to contribute the largest portion of its revenues, although the areas of commercial software and services are growing at a faster rate. Acquisitions to augment existing commercial offerings are possible.

- CCA has divided its research and development activities into two divisions. Together they contribute 64% of total revenues, or $3.5 million.

  - Sponsored Research Division: specializes in fundamental research projects. Efforts are directed towards the conceptualization and development of future systems. Work in this area has included participation in the creation of the first packet-switched network, ARPANET, for the Advanced Research Projects Department of Defense. CCA both designed and implemented the DATACOMPUTER, a large-scale data system for the ARPA network. Other projects include S.DD-I, the world's first distributed data base management system; and SDMS, an advanced graphics interface to a DBMS.

  - Advanced Development Division: designs operational systems to meet specific needs. The division has recently developed an information system for toxic substances for the Environmental Protection Agency.

- CCA looks to its research and development activities as a source for commercial products.

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- The Data Base Products Division provides specialized commercial software products. In 1979, the division contributed 27% ($1.5 million) of total revenues. The Model 204 Data Base Management System, introduced in 1971and upgraded annually thereafter, is the division's key product.

  - Model 204 is a generalized, data base management system designed to support users of IBM's OS, and OS/VS operating systems on System 360/370, or compatible computers. The product provides access to data in both batch and on-line modes and features an English-like user language. Interfaces are available to COBOL, PL/1, Fortran, and BAL programs. It is operated with its own teleprocessing monitor, IBM's CICS and Informatics' Intercomm Telecommunications monitors.

  - Four basic modules can be used to configure a Model 204 system:

    . Inverted File Access Method (IFAM), a proprietary implementation of the inverted file approach.

    . User language modules.

    . Host language interface.

    . Utility programs to build and maintain the data base.

  - The Model 204 has a wide range of application capabilities that include:

    . Financial analysis.

    . Personnel administration.

    . Federal information systems.

    . Scheduling and planning.

    . Inventory control.

    . Professional service billing and reporting.

    . Telephone directory assistance.

  - The system is available on several service bureaus.

  - The price of the system ranges from $60,000 to $150,000 depending on the configuration selected. Over 50 packages have been installed.

  - Model 204 is offered in Japan by Mitsui Knowledge Industries.

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- The Communication Products Division specializes in the development and marketing of electronic message-handling systems. The division contributed 9% ($470,000) of total 1979 revenues. Its main product is COMET (COmputer MEssage Transmission).

  - COMET is a software product providing an in-house electronic mailbox capability. COMET currently runs on DEC PDP11 minicomputers under the RSX or IAS operating systems, although it will be compatible with IBM Systems 370 and 3033 in 1981.

  - The package uses English-language commands and can be used to read messages, perform composition and editing, forward messages to other subscribers, answer messages, file and retrieve messages and summarize summarize key information about the messages in a file.

  - COMET provides the user with a non-interruptive method of receiving messages.

  - The system can be used in combination with word processing terminals and can provide access to TWX and Telex networks.

  - CCA offers COMET on a remote computing basis. Over 55 clients access the service via Telenet or Tymnet. Monthly charges are $100 per organization and $60 per individual subscriber. Standard usage includes up to nine hours of connect time. CCA's client base is growing at the rate of 10% each month, with the total number of subscribers exceeding 1,000.

    - COMET is offered in Canada by Canada Systems Group, by SIMPACT in Italy, and by Radio Suisse in Switzerland.

    - In the electronic mail marketplace, CCA's COMET service faces competition from GTE, Tymshare, Compuserve, and Scientific Timesharing.

  - CCA also offers the systems for in-house use. The software license fee is $40,000 for a one-time charge, or $1,446 per month for a three-year, full-payment lease.

    - Eight systems have been installed to date. The company is an OEM for Digital Equipment Corporation and will configure DEC PDP11 minicomputers to customer requirements in order to provide COMET on a turnkey basis.

INDUSTRY MARKETS

- In 1979, 80% of CCA's revenues were generated from the federal government. This figure will be reduced to 70% in 1980.

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- Remaining revenues were derived from software sales to all sectors, particularly the oil and aerospace industries.

GEOGRAPHIC MARKETS

- In 1979, less than $100,000 was derived from business in Europe and Canada. CCA anticipates that revenues generated in the Japanese, European and Canadian markets will account for $500,000 in 1980.
  - As the federal government is the company's primary client, much of its business tends to be in the Washington, D.C. area. Other clients are concentrated in New York, Boston, and Chicago.
  - CCA maintains a branch office in Arlington (VA), and sales offices in Chicago, Houston, New York, and San Francisco.

COMPUTER HARDWARE

- Computer equipment used for the COMET service, as well as for testing and development purposes, consists of:
  - One DEC PDP-10, 10X.
  - Two DEC PDP-11/70s UNIX, RSX 11M.
  - Two DEC PDP-11/40s, RSX 11M.
  - CCA's data center is located in Cambridge, Mass. Clients access the network via Telenet, Tymnet or direct dial.

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APPENDIX B: GENERAL ELECTRIC INFORMATION SERVICES COMPANY - COMPANY HIGHLIGHT

COMPANY HIGHLIGHT

GENERAL ELECTRIC INFORMATION SERVICES COMPANY
401 North Washington Street
Rockville, MD 20850
(301) 340-4000

Donald S. Bates, President
84% owned by General Electric Company, 16% owned by Honeywell, Inc.
Total Employees: 3,000
Total Revenues, Fiscal Year End 12/31/78: $193 million*

THE COMPANY

- General Electric Company announced the first commercial timesharing service in 1965. The MARK I service was initially available only in New York City and Phoenix. In 1968, when more than 20 major metropolitan areas were able to access the GE computers via a local telephone call, the MARK II service was announced. MARK III was created when the MARK II network and interactive remote computing were combined with a batch processing capability in 1972.

- General Electric Information Services Company (GEISCO) was formed in 1979 through a joint venture with Honeywell, Inc. The new organization consolidates the marketing of the General Electric Information Services (GEIS) MARK III services. Prior to 1979, Honeywell's timesharing marketing operations were the authorized distributors for MARK III in the United Kingdom, most Western European countries, and Australia. Honeywell retains about 16% of GEISCO.

- INPUT estimates GEIS' 1978 revenues at $193 million, of which 10% ($19 million) were derived from services provided to the parent and 18% came from international operations, primarily through the marketing arrangement with Honeywell. This $35 million in international revenues comes from the transfer price of 40% of HIS revenues plus revenues from other countries such as Japan.

  - INPUT forecasts that GEISCO's revenues will reach $310 million in 1979. This assumption is based on GEISCO getting the full HIS revenue base in the international sector and an internal growth rate of about 20%.
    - International operations should contribute $100 million (31%) to 1979 revenues.
  - GEISCO management claims that the company has maintained an annual growth rate of over 20% since its origin.

- GEISCO has recently made two acquisitions and intends to continue to use acquisition as an expansion mode.

* INPUT Estimate

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- Effective August 31, 1979, Mitrol, Inc. of Lexington, Massachusetts became a subsidiary of GEISCO. The nine year old Mitrol developed and has been marketing a manufacturing planning and control software system known as the Mitrol Industrial Management System (MIMS). Mitrol will operate as a distinct entity from GEISCO. GEISCO management has stated that it intends to become a full-function supplier of manufacturing services and will use the acquisition of Mitrol to help it achieve that corporate goal.
- Enercom of Tempe, Arizona was acquired in November, 1979. The Enercom programs provide utility companies with a system to evaluate residential customers' dwellings for energy efficiency. The Enercom programs presently run on the MARK III network.

KEY PRODUCTS AND SERVICES

- Approximately 98% of GEISCO's revenues are generated by processing services and 2% by professional services contracts. GEISCO offers a library of nearly 1,800 applications on its network and serves 5,000 clients. The MARK III Information Service consists of five major elements:

  - Interactive processing services (Foreground service).
  - Remote batch processing (Background service).
  - MARK III distributed data processing (MARKLINK).
  - IBM-compatible remote batch processing (MARK 3000 service).
  - Personnel services (field technical assistance; contract programming).

- GEISCO's MARK III network uses satellite links, undersea cables, and telephone lines to provide RCS services from three large computer complexes: two in the United States (Maryland and Ohio), and one in the Netherlands.

- The key applications on GEISCO's MARK III network are found in Exhibit A. While subscribers to the MARK III network can access applications developed both by GE and by independent software authors, the majority of products offered have been developed externally. Called Network Software Services (NSS), these products are offered under royalty agreements and are supported by author documentation, training, and technical support. GEISCO provides only general training sessions in use of the MARK III Information Services Network.

- Remote batch (Background) Service consists of GCOS processing on Honeywell 6000 series equipment which can connect with customer's in-house computing equipment for interprocessing.

- In November, 1978, GEISCO introduced MARK III distributed data processing as a fully integrated distributed data processing system with all components available from a single supplier. The components include the MARKLINK intelligent terminal, applications software, teleprocessing network, clustered host computers and system maintenance.

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EXHIBIT A
GEISCO
APPLICATIONS AVAILABLE ON MARK III SERVICE

APPLICATION AREA/PRODUCT NAME
• OPERATING ENVIRONMENT – HONEYWELL 60/66, MARK III, GCOS – IBM 370/3033, MVS, TSO – IBM 370/158, VS – TEXAS INSTRUMENTS
• PROGRAMMING LANGUAGES SUPPORTED – FORTRAN 77 – COBOL – PL/1 – BASIC
• DATA MANAGEMENT SOFTWARE – DMS III – HISAM – DM IV – SYSTEM 2000 – MARK IV – SAS – REQUEST – SITE II – EPICS – MARDATA
• DATA BASES AVAILABLE – MAP (ECONOMETRIC DATA BASE) – CURRENCY DATA BASE SERVICE – SECURITIES DATA BASE SERVICE – VALUELINE – NEMA (NATIONAL ELECTRICAL MANUFACTURERS) – DEPARTMENT OF COMMERCE (SIC) – FEDERAL TRADE COMMISSION – CITIBASE – PETROLEUM INSTITUTE – CORPORATE FINANCIAL DATA SERVICE – BUSINESS AND FINANCIAL DATA BANK – BI/DATA – COMMODITY FUTURES
• FINANCIAL APPLICATIONS/TOOLS – GENERAL BUSINESS ACCOUNTING – FINANCIAL ANALYSIS – FORECASTING
• INVESTMENT MANAGEMENT AND ANALYSIS – SECURITIES – REAL ESTATE – CAPITAL
• ENGINEERING – CHEMICAL – CIVIL – HEATING, LIGHTING AND VENTILATING – MECHANICAL – ELECTRICAL AND ELECTRONIC

APPLICATION AREA/PRODUCT NAME
• PETROLEUM INDUSTRY
• ELECTRICAL UTILITIES
• MANUFACTURING – INDUSTRIAL ENGINEERING – MANUFACTURING MANAGEMENT – NUMERICAL CONTROL – PRODUCTION SCHEDULING – QUALITY CONTROL
• INVENTORY CONTROL
• MATHEMATICS – SPECIAL FUNCTIONS – MISCELLANEOUS MATHEMATICS
• GRAPHICS AND PLOTTING
• NUCLEAR INDUSTRY
• MICROPROCESSORS
• MODELING, SIMULATION AND OPERATION RESEARCH AIDS – LINEAR PROGRAMMING – PROBABILISTIC MODELING AND SIMULATION
• PROJECT PLANNING AND MANAGEMENT – WORK MANAGEMENT SYSTEMS – JOBS
• STATISTICS – STATSYSTEM – SPSS – SIGMA – PROBABILITY
• MEDICAL AND HEALTH CARE SERVICES
• DISTRIBUTION
• RESEARCH
• OTHER – TIP (TELEPHONE INFORMATION PROCESSING SERVICE)

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- GEISCO uses a Texas Instruments intelligent terminal in its MARKLINK system. There is currently one installation of the system in the General Electric Supply Company.
- Each unit in the overall MARKLINK scheme is priced separately. A minimum minicomputer configuration including 64K bytes of main memory, one CRT and one floppy disk drive rents for $800 per month on a two year lease and sells for $21,230. A maximum configuration with 352K bytes, 16 terminals and 20M bytes of floppy storage rents for $3,690 per month and sells for $93,290.
- Communications and host processing are priced separately. Average cost for a user with ten remote sites used to perform order entry should run about $15,500 per month.
- Applications available on the mini include: inventory management and distribution functions.

- An IBM-compatible companion service to MARK III was inaugurated June 1, 1979 as GEISCO introduced its MARK 3000 service. State-of-the-art IBM technology for remote batch processing using the IBM Model 3033 central processor and MVS operating system comprises the new service which INPUT estimates generates between 2% and 4% of revenues. The MARK 3000 service couples with GEISCO's networking capabilities to benefit large-scale and small systems users.

- GEISCO offers professional services to MARK III clients in the form of technical support for problem solving, programming approaches, and efficient use of the MARK III service.

- In addition, GEISCO has a Custom Application (CA) group of 150 programmer/analysts. Contract programming services primarily support application development for new and existing clients of the network.

INDUSTRY MARKETS

- GEISCO has either developed or acquired specialized software packages for use by a group of targeted industries including: manufacturing, banking and finance, telephone, and energy-related industries.

- In addition, GEISCO offers general business services to most industries.

GEOGRAPHIC MARKETS

- Eighty-two percent of GEIS's 1978 business was derived from the United States, and 18% from international operations.

- The MARK III network uses approximately 300,000 miles of circuits in its span to 24 countries, including 600 cities. Recent extensions have carried the service to Venezuela and Saudi Arabia.

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- In Japan, GEISCO has a joint venture with Dentsu, an advertising agency.

COMPUTER HARDWARE AND SOFTWARE

- The GEISCO network uses approximately 200 computers. Most of them are Texas Instrument minicomputers handling communications. The main machines are concentrated in super centers in Cleveland, Ohio, Rockville, Maryland, and Amsterdam and consist of:

  - 60 Honeywell Series 60 Level 66/DPS's operating under GEISCO proprietary software for interactive processing and GCOS for background batch running.
  - IBM 3033s operating under MVS for background batch services.

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APPENDIX C: BACKGROUND TO THE REGULATION OF THE U.S. COMMUNICATIONS INDUSTRY

APPENDIX C: BACKGROUND TO THE REGULATION OF THE U.S. COMMUNICATIONS INDUSTRY

- Interstate communications comes under Federal Communications Commission (FCC) regulation by the provision of Title II of the Communications Act of 1934, which is still the applicable law in effect. This Act also created the FCC.

- The 1934 Act was passed to encourage the formation of a nationwide telecommunications system, based on the concept that such a system would be a "natural monopoly."

- The provisions of the 1934 Act have become increasingly anachronistic since the goal of building a nationwide telecommunications system has been fully achieved, and the assumption of "natural monopoly" is becoming increasingly questionable in the light of new technology.

- The increasing irrelevance of the law's provisions in today's environment has placed augmenting stresses on the FCC and the courts, as they attempt to reconcile the law with rapidly changing technology and market conditions.

- Beginning in 1968, the FCC has undertaken a series of moves designed to permit increasing degrees of competition in areas that were previously under a government-regulated monopoly held by AT&T and its subsidiaries. These include:

- The Carterfone decision of 1968, which permitted the attachment of "foreign" (non-Bell) equipment to Bell communication lines.

- The 1971 decision to allow specialized common carriers to offer interstate, point-to-point private lines in competition with AT&T's Long Lines Division.

- In 1976, in an effort to stem the FCC's moves to permit the entry of new competitors into the interstate communications services, AT&T instigated a proposed legislation which would have, in effect, prohibited such competitive entries. The bill, officially named the "Consumer Communications Reform Act of 1976" (H.R. 12323), was referred to by its many opponents as the "Bell Bill," because it was so blatantly biased in favor of AT&T. Despite AT&T's massive lobbying in favor of the bill, it failed to pass.

- In 1978, an attempt at a complete rewrite of the 1934 Act was introduced by Representative Lionel Van Deerlin (D-Calif.), chairman of the House Communications Subcommittee.

  - Perhaps the main impact of the original Van Deerlin bill in the area of data/voice communications would have been the provision that prohibited cross-ownership of manufacturing facilities by providers of monopoly communications services. This would have forced AT&T to divest itself of its main manufacturing arm, Western Electric. GTE would also have been affected and would have been required to establish separate entities for manufacturing and regulated communications services.

  - The divestiture of Western Electric has long been the objective of antitrust proceedings initiated by the Justice Department, basically on the grounds that, when AT&T and its subsidiaries buy their equipment exclusively from WE, there is no way to tell what the market value of the equipment would have been under a more competitive arrangement; and the value of assets is the prime determining factor in setting regulated service rates.

- Another provision of the initial Van Deerlin bill would have replaced both the seven-member FCC and the NTIA with two separate bodies:

  . A five-member Communications Regulatory Commission to establish rate structures and administer technical regulation.

  . National Telecommunications Agency, a policy-setting body for communications.

- On the whole, the impact of the bill would have been to lessen regulation and encourage competition.

• After prolonged hearings, deliberations, and a revised version of the bill introduced in March, 1979, the bill has now been re-introduced in a drastically revised, reduced version.

- The new bill (H.R. 6121), Van Deerlin's third attempt, no longer asks for a breakup of the FCC. Instead, it stipulates: "Competition shall be relied upon to the maximum extent possible to determine the availability, variety, quality, and cost of telecommunications services and facilities."

- The bill would deregulate all intercity services and carriers, with the exception of "dominant carriers," defined to include only AT&T.

- Under the bill, local phone companies would be permitted to charge an "access fee" to intercity carriers.

- The bill restricts AT&T and Western Electric from engaging in activities other than basic communications.

- However, AT&T would be permitted to offer data processing services and products through fully separate subsidiaries, with accounting systems that ensure that monopoly revenues are not used to support competitive services.

- The cross-ownership provision that would have required AT&T to divest itself of Western Electric was abandoned.

- Not unexpectedly, the new version of the bill is being strongly opposed by various industry associations (ADAPSO, CCIA, IDCMD, and NATA) as being too soft on AT&T.

- The bill in its present form was approved by the House Communications Subcommittee in February 1980, and came before the full House Commerce Committee in March. A decision is still pending.

- The Senate Communications Subcommittee is also considering several draft bills. There are, however, considerable partisan differences in connection with these bills, and, as a result, the passage of any kind of communications bill into law in 1980 is far from certain.

A. FCC REGULATORY ACTIVITIES UNDER THE COMMUNICATIONS ACT OF 1934

- The Landmark Carterfone decision in 1968 was the first in a series of FCC moves to admit new competitors into activities that were previously strictly within AT&T's Bell System's regulated domain.

- The blurring of the demarcation line between the traditionally regulated communications activities and the fiercely competitive data processing domain motivated the FCC to launch, in 1971, its first Computer Inquiry, now known as "Computer Inquiry I."

- The results of Computer Inquiry I may be summarized as follows:

  - The FCC decided it would not assert regulatory authority over data processing activities, whether or not such activities involved communications facilities, such as linking subscribers' terminals to central computers.

  - This opened the door for common carriers such as AT&T to offer data processing services, raising the objection that the monopoly of AT&T, protected by government regulation, would present an unfair competitive advantage vis-a-vis the unregulated data processing suppliers.

  - To alleviate this difficulty, the FCC adopted a policy of "maximum separation," under which common carriers were required to establish separate corporate entities for furnishing data processing services.

  - To distinguish between "data processing" and "communications" for the purposes of applying the maximum separation policy and the "forbearance" policy of declining to regulate "data processing," the FCC postulates a set of definitions of what constitutes "communications" and "data processing."

- Since the release of the FCC's final decision in Computer Inquiry I, technological and market developments showed that the matter of "communications" versus "data processing" needed a thorough re-examination.

- This re-examination, launched by the FCC in August 1976, is now known as "Computer Inquiry II."

- Specific issues on which the FCC solicited comments under Computer Inquiry II were:

  - Refinement of the definitions of "data processing" and "communications," in view of such developments as the Distributed Data Processing

(DDP) networks and intelligent terminals, which combine DP functions and communications facilities.

- The question of regulated common carriers offering sophisticated terminals on a competitive basis.

- In March 1977, after the FCC decided (in November 1976) to authorize AT&T to offer the Dataspeed 40 terminals (manufactured by its Teletype subsidiary) as a tariffed offering by AT&T's regulated Bell subsidiaries, Computer Inquiry II's scope was supplemented to include the issued raised by a common carrier's provision of peripheral devices that include processing capabilities.

- A major milestone in Computer Inquiry II was reached on May 17, 1979, when the FCC adopted a tentative decision. The elements of this tentative decision can be summarized as follows:

  - The FCC proposed to divide common carrier services into three categories:

    . Voice.

    - Basic non-voice.

    . Enhanced non-voice.

  - The "voice" category encompasses the traditional human-to-human oral communication; i.e., the "plain old telephone."

  - The "basic non-voice" category encompasses pure transmission in which neither context nor form of the message is in any way changed or rearranged.

- The "enhanced non-voice" category encompasses services that employ computer processing to act on such things as the context, format, code and protocol of the transmitted messages.

- The FCC concluded that common carriers owning transmission facilities used in interstate communications can offer "voice" and "basic non-voice" services, but not "enhanced non-voice."

- The FCC further ruled that such common carriers may offer "enhanced non-voice" services only through a separate corporate entity, which would have to purchase the necessary basic communications services from the common carriers before reselling them to the public as "enhanced" services; and that the computer facilities used by common carriers to provide "voice" and "basic non-voice" services may not be used for computer processing associated with "enhanced non-voice" services.

- The effect of this ruling is to change the previous concept of separation between "data processing" and "communications" to that of separation of an underlying basic service offered by a common carrier under regulated tariffs, and the reselling by "resale subsidiaries" of enhanced communications services which combine with processing activities.

- Resale subsidiaries can offer data processing services on an unregulated (non-tariffed) basis.

- Resale carriers are allowed to offer any sophisticated terminals for use on the customer premises (so-called "Customer Premises Equipment," or CPE) as part of the "enhanced non-voice" service.

- Resale carriers are allowed to offer terminal equipment on a competitive, non-regulated basis.

- The FCC classified terminals in two types:

. Basic media conversion devices.

. Equipment which does more than basic media conversion.

- Equipment which performs just basic media conversion (e.g., a modem or a non-intelligent terminal) can be offered by the common carriers as tariffed parts of "voice" or "basic non-voice" services.

- Equipment which performs more than basic media conversion (e.g., intelligent terminals) can be offered by common carriers only through separate corporate entities; if offered on a tariff basis, it must be through a resale carrier as part of an "enhanced non-voice" service. However, such equipment need not be offered under tariffs; i.e., it may be offered on an unregulated basis by anyone, including separate corporate entities of the common carriers.

- The FCC also addressed the question of the 1956 AT&T Consent Decree, under which AT&T agreed to restrict its activities to regulated communications services and markets.

- The FCC proposed to undertake the interpretation of the Consent Decree as it applied to controversial instances.

- In particular, the FCC proposed to determine on a case-by-case basis whether the offering of CPE or an "enhanced non-voice" service is "incidental" to the provision of a communications service and, therefore, permissible under the terms of the Consent Decree.

- Further, the FCC stated that where market forces promise to obviate the need for regulation, and where the offering by AT&T of a particular processing activity associated with an "enhanced non-voice" service or CPE appears to be in the public interest, its intent is to allow such offerings under the Consent Decree exception provision.

- In a Further Notice of Inquiry, the FCC sought comment on still more issues that remain unresolved. In particular:

  - Whether "enhanced non-voice" should be classified as "communications" and therefore come under federal regulation, or whether "enhanced" communications and CPE should be deregulated.

  - Whether the resale principle should apply to all common carriers or just to "dominant" ones.

  - Whether the 1956 Consent Decree needs to be modified to account for technological and market changes.

  - Whether the proposed resale structure should also apply to the IRCs (International Record Carriers).

- The impact of the Tentative Decision can be summarized as follows:

  - AT&T is permitted to offer "enhanced" services via separate subsidiaries.

  - This means especially that the proposed Advanced Communications Service (ACS), which AT&T proposed in July 1978, would be permitted.

  - However, the separate subsidiaries ("arm's-length" concept) would be a stronger safeguard against cross-subsidizing competitive offerings from profits realized on regulated services than was possible under the previous rules that simply required separate accounting.

  - Another area opened up to AT&T by the Tentative Decision is that of PABX - Private Automatic Branch Exchange (computerized switchboards). Here the issue is that Bell's Dimension line of PABX has some data processing capability, with industry-type applications software, such as the hotel/motel package offered by Bell companies since 1978. Again, this would have to be done via a separate corporate entity.

- The areas that were left unresolved, as outlined by the Further Notice of Inquiry, have the following significance:

  - Exactly how much separation would be required to satisfy the "separate corporate entity" requirement; the Common Carrier Bureau staff favors maximum arm's-length separation, possibly going as far as separate books, management and directors.

  - By allowing AT&T subsidiaries to file for tariffs on "enhanced" services and CPE, the FCC opens the door for AT&T to comply with the 1956 Consent Decree while offering services and products in markets where, strictly speaking, AT&T agreed to stay out. The FCC asked for additional input on this question.

- Nearly 50 parties responded to Computer Inquiry II with comments and formal filings; they included large and small monopoly common carriers, other common carriers (OCCs), international record carriers (IRCs), banks, data processing vendors and industry associations, as well as NTIA (National Telecommunications and Information Agency, a unit of the Commerce Department) and the Justice Department.

- Although there was a general agreement on the principles embodied in the Tentative Decision (with the notable exceptions of the Justice Department and Western Union), there was also a great deal of disagreement on many of the details.

- The Justice Department and Western Union favored retaining the existing rules with some amendments.

  - The Justice Department is opposed to any regulatory action which could obviate the need to continue its current anti-trust suit against AT&T.

- Some of the areas of controversy are as follows:

- AT&T, some data processing vendors, and industry associations want to apply the "resale structure" principle to all common carriers, while other monopoly carriers, some industry groups, some data processing vendors, as well as NTIA, the OCCs, and the IRCs wish to apply that principle to "dominant carriers" only; with further disagreement on the definition "dominant."

- Large monopoly carriers and NTIA want a flexible, non-restrictive approach to the principle of separation, so that the benefits of vertical integration would still apply; while most other respondents want a maximum "arm's-length" separation policy.

- There was disagreement over the adequacy of the definitions of "voice," "basic non-voice" and "enhanced non-voice" services, and fears that they were either too broad (and would eventually draw all data processing under regulatory control) or too narrow and unduly restrictive in allowing offerings by common carriers.

- Monopoly carriers and some other common carriers argued that the FCC should regulate "enhanced" services, while many other respondents argued against such regulation on the various grounds that:

  . Such "enhanced" services were not "communications."

  . Provision of such services by resale carriers is exempt from Title II of the 1934 Communications Act because such carriers are "private" rather than "common."

  . The FCC has the authority to decide not to regulate such services and it should exercise that authority as a matter of policy.

- Other major conflict areas related to data communications under study by the FCC include:

- The reselling or sharing of private lines. This would allow a group of users, or a reselling firm, to lease private lines from AT&T and resell chunks of the bandwidth to end users who could not justify the cost of a private line by themselves. AT&T is vehemently opposed on the grounds that such services, in effect, fall into the Message Toll Service (MTS) class - the heart of the regulated intercity and long-distance public telephone network offered by AT&T; while AT&T's competitors, especially the specialized common carriers, are enthusiastically in favor of such reselling or sharing.

- The international record (telex) traffic. The FCC issued a number of rulings that allow IRCs to extend their facilities directly into more areas in the U.S., and at the same time, allow domestic record carriers greater access to international business. The controversy is especially fueled by the technique, used by some domestic carriers, of establishing a point-to-point connection with a foreign-based carrier who then handles the international routing of messages, bypassing the U.S. facilities of the IRCs altogether.

- AT&T's rate structure for private lines, called Multi-schedule Private Line (MPL), is a subject of intense controversy. AT&T introduced MPL after the FCC rejected the Telpak rates. MPL charges for private lines are based in part on the density of traffic between the cities served: higher rates are charged on low-traffic links. AT&T's formal rationale is that this schedule reflects the true cost of providing service in the rural areas. AT&T's competitors charge that MPL is simply a scheme to allow AT&T to compete more effectively with the specialized common carriers, which concentrate their offerings between high-traffic points. The FCC agreed with this assessment and rejected MPL tariffs from AT&T a number of times. The issue is still unresolved.

- On April 7, 1980, the FCC issued its final decision on the Second Computer Inquiry.

- This decision attempts to resolve two fundamental issues which have plagued the FCC for many years:

  - The deregulation of customer premises equipment (CPE). (As previously pointed out, the FCC has traditionally tended to distinguish between voice and data terminals in past deliberation.)

  - The possible regulation or deregulation of data communications and/or data processing services. (This was previously approached through a complex exercise in semantics which assumed that communications services would be regulated and data processing services would not; the result was a broad, grey area called "hybrid services.")

- The issue of CPE has been clearly addressed by the FCC decision: <u>both</u> voice and data terminals will be deregulated effective March 1, 1982.

- The services provided by common carriers have been defined as either "basic services" or "enhanced services."

  - <u>Basic services</u> provide for transmission of information.

  - <u>Enhanced services</u> add data processing services that change (or enhance) the transmitted information.

  - <u>Only basic services will remain regulated.</u>

- Common carriers, other than AT&T and GTE, are not required to maintain maximum separation of regulated communications services from unregulated data processing services.

- Carriers under the direct or common control of AT&T and GTE will be treated in the following manner:

- They may not market, install, service or maintain CPE except through a separate subsidiary. The separate subsidiary, in turn, may not provide transmission equipment. (This rule may be relaxed in sparsely populated areas.)

- They may not provide enhanced services except through a separate subsidiary. (CPE may be provided in conjunction with the enhanced services provided through this subsidiary.)

- Last, but not least, AT&T is not prohibited from providing enhanced services for CPE under the terms of the 1956 Consent Decree.

- AT&T and other telephone companies will now be forced to compete in the open market for both business and residential telephone and terminal equipment.

  - It will no longer be possible to bundle such equipment with transmission service.

  - This creates a truly competitive situation and should lower the costs of CPE. Current telephone interconnect equipment vendors may face reduced profit margins once AT&T starts to compete.

  - The removal of CPE from the common carriers' cost base will have an unpredictable impact on the rates for basic services. (A Federal-State Joint Board will be convened to determine if other cost allocations should be adjusted.)

  - AT&T has significant advantages in terms of a manufacturing economy of scale, but it does not welcome the marketing challenge of potential competitors, especially IBM.

- The provision deregulating enhanced services will provide opportunities for many computer services companies to sell basic communications services.

While this has been happening on a sub rosa basis for years, it will permit much greater flexibility in the offerings of such companies. The Tymshare/Tymnet relationship will no longer be required.

- AT&T would be permitted to enter the enhanced services area through a wholly owned subsidiary. If INPUT's analysis is correct, this has the following ramifications:

  - The subsidiary could sell value added communications services in competition with the fledgling VANs.

  - The subsidiary could also sell CPE and include a wide variety of "intelligent terminal equipment" that will become increasingly difficult to distinguish from minicomputers (or even mainframes).

  - In addition, both software and processing services could be provided by the subsidiary's network. AT&T would be involved effectively in all aspects of the data processing market.

- In August of 1980, GTE-TELENET applied for a tariff permitting it to offer its electronic mailbox service called TELEMAIL. The Common Carrier Bureau of the FCC rejected the tariff filing on the grounds that the final decision of the Second Computer Inquiry made this an enhanced service and not subject to regulation.

  - If this decision holds up to further scrutiny, it affirms the right of other vendors to offer electronic mailbox services.

  - In effect, all vendors with enhanced communications networks may offer an untariffed electronic mail service. Only AT&T and GTE would be regulated, although separate subsidiaries of these, as with GTE-TELENET, could offer services untariffed.

APPENDIX D: DEFINITIONS

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A. SATELLITE BUSINESS SYSTEMS

- SBS is owned equally by IBM, Comsat and Aetna. Its planned offering is a satellite-based, wide-band, all-digital, multipurpose communications service.

- The heart of the service is a geosynchronous satellite, expected to be launched in October 1980, equipped with eight transponders operating the 12-14 GHz band. Each transponder will be capable of 41 Mbps transfer rate.

- The initial concept was to offer a wide-band service (56 Kbps minimum) exclusively to Fortune 100 organizations that could foot the bill of constructing the expensive earth stations.

- There are indications that SBS is now looking for ways to add to its potential customer base. SBS is, for instance, working with AM International on a very fast facsimile network (1 second/page rate as opposed to the current 4-5 minute/page).

- The SBS service is meant to encompass practically all forms of communications, including high-speed data transfer (to provide, for instance, a quick transfer of massive data bases as a form of disaster recovery and backup), teleconferencing (possibly with full-motion video) and voice.

B. AT&T ADVANCED COMMUNICATIONS SERVICE (ACS)

- ACS (Advanced Communications Service), announced in July 1978, has stirred a storm of controversy. Since then, AT&T announced a delay in the proposed October 1979 service start, and then, in November 1979, AT&T withdrew its FCC filing entirely. The future of the service at this point is uncertain.

- The main feature of ACS was to be the ability to interface practically any kind of terminal to any type of host computer or other terminal via a nationwide, computerized, all-digital, packet-switched network. Code, speed and format incompatibilities were to be resolved by the network.

- ACS nodes were to contain a duplex DEC 11/70 for message switching, with duplex 11/34 front ends for data switching; further in front, locally or remotely, a microprocessor-based "Network Access Controller" would intercept the incoming access lines. (The difficulties ACS has experienced are attributed by some observers to the discovery that the computers selected proved underpowered for the job).

- Access to the nodes was to be via the AT&T Dataphone Digital Service (DDS). (Analog access would be converted to digital by a remote NAC.) Access speeds were to 2.4, 4.8, 7.2, 9.6 and 56 Kbps. Most types of terminals were to be attachable - asynchronous character, block or polled, synchronous polled, and synchronous contention.

- Some of the services planned were:

  - Polling.

  - Broadcasting.

  - Authorization checking.

- Error recovery.

- Journaling.

C. XEROX TELECOMMUNICATIONS NETWORK (XTEN)

- Xten is a proposed, satellite-based, multifunction, nationwide communications service. The service is meant for document distribution, data communication, teleconferencing and voice. It is intended to provide terminal compatibility features similar to ACS's. Unlike ACS, the Xten plan calls for microwave access to the local nodes, which in themselves are microwave-linked to the earth stations.

- The Xten plan was filed with the FCC in November 1978. About a year later, Xerox acquired Western Union International, and apparently has decided to disband the original Xten group in Woodland Hills (CA), transferring the responsibility to WUI in New York. This transfer is causing some question about the future of the project and its schedule.

APPENDIX E: QUESTIONNAIRES

CATALOG NO. YRIT□□

COMPUTER CORPORATION OF AMERICA USER QUESTIONNAIRE

ELECTRONIC MAILBOX SERVICES

1. What electronic mailbox service does your company use?

   _____ Computer Corporation of America

   _____ Other _____

   _____ Other _____

   _____ Other _____

2. What is this service called?

   _____

3. When did you begin using this service?

   _____

4.A. Why did you decide to use an electronic mailbox service?

   _____

   _____

   _____

   _____

   B. Why did you choose this particular vendor?

   _____

   _____

   _____

   _____

C. Is this electronic mail service:

_____ Intra-building

_____ Intra-company

_____ Between parent and subsidiary

_____ Between company and client

_____ Other _____

_____

D. To what cities or countries do you communicate?

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

5.A. What types of messages are sent intra-building?

_____

_____

_____

B. What types are sent intra-company?

_____

_____

_____

C. What types are sent to locations in other countries?

_____

_____

_____

D. What routine or occassional messages are sent?

_____

_____

_____

6.A. What hardware do you have installed to drive this system?

_____

_____

_____

B. How much memory is required?

_____ mb

C. How many terminals do you have installed?

Manufacturer _____

Number _____

D. What rate of transmission do you use?

_____ bps

_____ bps

E. How many circuits do you transmit on?

_____

7.A. How many people have access to the electronic mailbox service to send messages?

_____

B. What level of management are they?

_____

C. What percentage is this of the total number of employees?

_____ %

D. How many can receive messages only?

_____

E. What level of management are these?

_____

F. What percentage is this of the total number of employees?

_____ %

G. Do you have full-time terminal operators for this service?

Yes _____

No _____

8.A. How many messages per day does the average user send?

_____

B. How long is a message usually kept in the mailbox?

_____

C. How long is the typical message (number of characters)?

_____

D. How many total messages does your company average per day?

_____

E. What does this service cost per month?

$ _____

9.A. What do you like about the electronic mailbox service?

_____

_____

_____

B. What would you like to see improved?

_____

_____

_____

C. On a scale of 1-5 (1=low 5=high), how satisfied are you with your current service?

_____

10.A. Do you plan to add new capabilities to the service in the future?

Yes _____

No _____

Describe: _____

_____

_____

B. Do you plan to expand the use of the service through:

_____ Greater geographic coverage

_____ Greater access to currently qualified persons

_____ Expanding access to more people

Describe:

_____

_____

_____

11.A. Do you use other specialized services for communications? (Telenet, Tymnet, SPSS, Leased lines, VAN, etc.)

Describe: _____

_____

_____

B. Why did you choose these specific services?

_____

_____

C. Have they been satisfactory?

Yes _____

No _____

D. How has the usage of electronic mailbox impacted the use of specialized communications vendors?

_____

_____

_____

E. Will this change in the future?

_____

_____

_____

12.A. Do you use any timesharing services?

Yes _____

No _____

B. For what applications?

_____

_____

_____

C. What vendors do you use?

_____

_____

_____

D. How do you choose these vendors?

_____

_____

_____

E. How satisfied are you with these services?

_____

F. How has the electronic mailbox service affected the use of timesharing services?

_____

_____

_____

13.A. Do you use facsimile machines and/or communicating word processors?

FAX Yes _____ No _____

W/P Yes _____ No _____

B. How many?

FAX _____

W/P _____

14. Do you plan to use any of the new communications networks when they become available? i.e.:

Yes	No	
_____	_____	Satellite Business Systems (IBM)
_____	_____	X-Ten (Xerox)
_____	_____	ACS (ATT)

15. Of the total communication network service costs,(communications carriers, Fax, W/P, mailbox, etc), what percentage will electronic mailbox represent?

_____ %

CATALOG NO. Y R I T

GENERAL ELECTRIC INFORMATION SERVICES CORPORATION USER QUESTIONNAIRE

ELECTRONIC MAILBOX SERVICES

1. Does your company currently use an electronic mailbox service?

☐ Yes ☐ No

A. If yes:

Switch to Y-RIT Questionnaire #1

B. If no:

Continue

2. Have you ever considered using an electronic mailbox service?

☐ Yes ☐ No

A. If yes, what were your conclusions?

_____

_____

_____

3.A. What are the advantages of using an electronic mailbox system?

_____

_____

_____

B. What are its shortcomings?

_____

_____

_____

4. If you were to use such a service, what vendor would you prefer?

- ☐ GE
- ☐ Tymshare
- ☐ GTE-Telenet
- ☐ Computer Corp. of America
- ☐ Other _____

_____

_____

A. Why? _____

_____

_____

B. Would vendors already serving you on a network timesharing system be more desirable?

_____

5. Would you use an electronic mailbox service?:

- _____ Intra-building
- _____ Intra-company
- _____ Between parent and subsidiary
- _____ Between company and client
- _____ Other _____

_____

A. To what cities or countries would you need to communicate?

_____ _____

_____ _____

_____ _____

6. A. What types of messages will be sent intra-building?

B. What types will be sent intra-company?

C. What types will be sent to locations in other countries?

D. What routine or occassional messages?

7. A. How many people would you foresee having access to the electronic mailbox service to send messages?

_____

B. What level of management?

_____

C. What percentage is this of the total number of employees?

_____%

D. How many to receive messages only?

_____

E. What level of management are these?

_____

F. What percentage is this of the total number of employees?

_____%

G. Would you require full-time terminal operators for this service?

Yes _____

No _____

8. What volume of messages would you forsee?

_____

_____

_____

9. A. Do you use specialized services for communications? (Telenet, Tymnet, SPSS, Leased lines, VAN, etc.)

Describe: _____

_____

_____

B. Why did you choose these specific services?

_____

_____

_____

C. Have they been satisfactory?

Yes _____

No _____

D. How would the usage of electronic mailbox impact the use of specialized communciations vendors?

_____

_____

_____

10. A. What timesharing services do you use?

1. _____

2. _____

3. _____

4. _____

B. For what applications?

_____

_____

_____

C. How do you choose these vendors?

_____

_____

_____

D. How satisfied are you with these services?

_____

E. Would the electronic mailbox service affect the use of timesharing services?

_____

_____

_____

11. A. Do you use facsimile machines and/or communicating word processors?

FAX Yes _____ No _____

W/P Yes _____ No _____

B. How many?

FAX _____

W/P _____

12. Do you plan to use any of the new communciations networks when they become available? i.e.:

_____ _____ Satellite Business Systems (IBM)

_____ _____ X-Ten (Xerox)

_____ _____ ACS (ATT)

13. Of the total communication network service costs, (communications carriers, Fax, W/P, mailbox, etc.), what percentage would electronic mailbox represent?

_____ %